Virginia Medical Monthly

Official Organ of the Medical Society of Virginia

Vol. 51, No. 10.
WHOLE No. 871.

RICHMOND, VA., JANUARY, 1925

20 CENTS A COPY
$2.00 A YEAR

Original Communications

ENDOCRINOLOGY: ITS RELATION TO INTERNAL MEDICINE.*

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The opening discussion of a subject such as endocrinology should logically embody a review of the actual status of the field as applied to the general domain of medicine. In the present instance, this review assumes almost the importance of a duty, in view of the fact that at no time in its history has endocrinology stood in a more precarious condition.

The profession at large has been practically divided into two camps: the ultra-conservative, who are with just cause disconcerted by the maze of groundless and unsupported theories with which the whole subject has been surrounded in recent years; and the over-confident, who are the authors of these unwarranted theories, and, who administer organic products in practically all disorders without any regard for physiologic effects. Their over-enthusiasm may be attributed to the absence of any concrete knowledge concerning the role of these organs themselves in the body. It is encouraging and refreshing, however, to know that there exists a third class who occupy the moderate zone, hence, the choice of this subject for discussion by this body.

In a recent communication from one of the largest manufacturers of endocrine products in America, a conservative estimate is given of six millions of dollars spent annually in the United States for endocrine products. The medical profession is responsible for this expenditure, for rarely, if ever, are such products purchased except on a physician's prescription. It would seem then that there exists an economic reason for serious consideration of this subject. It is my firm conviction that if we, as physicians, would familiarize ourselves with the established truths concerning the endocrine system, and let these facts be our guide instead of the hypothetical fantasies presented on the backs of our office blotters, all of the thyroid, pituitary and ovarian glands from the abattoirs of these United States would not be consumed annually to supply the rapidly increasing demands for these products.

In this discussion I will confine myself to those facts, which, upon investigation, appear to have either sound clinical or experimental foundation, excluding as far as possible, all unreliable, fantastic, and purely hypothetic material. To follow a definite plan in the presentation of the data relating to these glands has been found impossible because of my failure to find sufficient reliable material relating to them.

With the exception of the internal secretion of the pancreas as it is related to diabetes mellitus, a discussion of which would be irrelevant to this program, we perhaps possess a more detailed knowledge of the anatomy, physiology, chemistry, and pathology of the thyroid gland than any other gland having an internal secretion. I shall attempt to review as briefly as possible some of the more important facts in thyroid physiology and their applications to the problem of the control of thyroid disease.

The major function of the thyroid, as we now know it, is to provide a means through its iodin-containing hormone for maintaining a higher rate of metabolism than would otherwise exist and for varying this rate. The functional activity of the gland is controlled chemically through the blood stream, and, also, indirectly through the sympathetic nervous system. The thyroid gland exhibits wide range of functional activity to meet the great variations in metabolism occurring during the life cycle of the organism. There is a notable increase in thyroid activity at puberty, during pregnancy and lactation, during the menopause, during protracted febrile reactions, and following the prolonged use of certain diets, particularly those of a high fat and protein content. Increased thyroid activity is associated with a decreased iodin store in the gland, provided the intake of iodin is not correspondingly increased. When the iodin store falls below 0.1 per cent, hypertrophy and hy-

*Read as part of the symposium on Endocrinology at the meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

XUM

perplastic changes are regularly found. In comparing further the varying degrees of thyroid hyperplasia and iodin store, it is found that in glands with high degrees of hyperplasia, iodin is usually absent or present only in traces. The primary or basic anatomic changes in the thyroid in goitre are relatively simple. Hypertrophy, hyperplasia, atrophy or colloid (resting state), these cell changes are not characteristic of any clinical disease as has been supposed, but occur in response to any stimulus entailing increased thyroid activity. From a clinical standpoint, the specific diseases in which the thyroid gland is known to play an important role may be divided into two groups: first, Thyroid insufficiencies, of which the important examples are simple goitre and myxedema; and second, Hyperthyroidism—exophthalmic goitre and toxic adenoma.

Simple Goiter, endemic, epidemic or sporadic, is only a local sign of a specific deficiency disease. It is a compensatory or work hyperplasia of the thyroid gland, developing during the course of certain metabolic disturbances of unknown nature, but immediately dependent on a relative or absolute deficiency of iodin. Clinically, it is characterized by a diffuse enlargement of the thyroid gland and gives none of the primary or secondary manifestations of exophthalmic goitre and no elevation of basal metabolism. Its prevention is simple and has been amply discussed by the State Board of Health. In long standing cases, curative measures are unsatisfactory. In early cases, iodin or desiccated thyroid is quite dramatic in its effect. Perhaps the most satisfactory plan of treatment is to administer from 2 to 4 grams of desiccated thyroid in 0.2 gram doses daily and, after allowing an interval of two weeks without treatment, to saturate the thyroid with iodin by giving 30 c.c. of syrup of hydriodic acid in ½ c.c. doses daily. This treatment to be repeated every fourth or sixth month.

Myxedema of adults, as a rule, presents itself in such characteristic fashion that its recognition is simple. The milder types of hypothyroidism, especially those associated with goitre and secondary to diffuse thyroiditis, are of much more clinical importance and are more difficult to diagnose. One is almost solely dependent upon metabolic readings to establish the diagnosis, for the syndrome may be simulated by various conditions indistinguishable without this observation. My impression is that hypothryoidism is the most important hypo-functional state of the entire endocrine system.

Exophthalmic Goitre: The conditions which result from an apparently over active thyroid gland were formerly classified as neurosis. These disorders can be defined as abnormalities in the functions of one or more parts of the nervous system for which there are no corresponding demonstrable nerve lesions. The manifestations of hyperthyroidism are of this character and should be designated as neurosis because that terminology helps to direct attention not only to the probable locality and manner in which the thyroid products act, but to the general nature of the disturbance. It is traceable to certain alveoli which differ from those of the normal thyroid, and, if the duration and intensity of the process is sufficient, morphologic changes occur in other organs. It would seem that this process originates as the result of acquired or congenital weakness, either in the autonomic nervous system or in a weak thyroid. On the one hand, many persons possess a biological weakness of the nervous system, and conditions requiring their active functionation necessitate a corresponding thyroid activity. The thyroid, of evident importance for the nervous nutrition, then fails or overacts. These cases are generally characterized by preceding neurosis, and later, by recognizable hyperthyroid symptoms. Others, and they constitute the majority of the hyperthyroid cases, originate not in "weak nerves," but in a weak thyroid, and this has a very close relationship to the gland's ability to obtain or to metabolize iodin.

The gland's main function is the production of energy. To fulfill this duty, the organ must have available a certain minimum amount of iodin and it must possess a minimum amount of functionally active epithelium. The conditions under which the first signs of the hyperthyroid neurosis develop are almost always those requiring an excessive expenditure of one or another kind of energy. This may be to resist acute or chronic infection, or to endure pregnancy and labor, or to sustain muscular exertion, or most often to withstand an unfavorable environment. Coincident with this, there are the usual signs of ordinary fatigue. In the presence of a goitre, the symptoms are interpreted as hypothyroidism. If the excessive requirements persist, compensatory hyperplasia advances, and the relative hypothyroid state is followed by that of hyperthyroidism. The

hyperthyroid condition orignates in a weak thyroid which overacts not because of a primary and vicious functionation, but because the gland's epithelium under strain or demands, which are excessive, fails in its power to metabolize iodin. The symptoms of typical hyperthyroidism are traceable chiefly to an abnormal or unchecked activity in the autonomic nervous system. The thyroid product has a selective and stimulating affinity for the parasympathetic or vagus terminals; its part in the production of chemical enrgy can be briefly described as that of "drive." The adrenal product, by its corresponding effect upon the opposing or sympathetic terminals, can then be supposed by its inhibition of each organ's metbolism to act as the opposing automatic check. Any break in this chain should lead to the development of a vicious cycle. The most vulnerable link should be in the terminals of the vagus or sympathetic nerves. It is presumable that either of these may have its function interrupted or destroyed by bacterial or other poisons, or, as is clinically common, by fatigue. These facts have a very positive bearing upon the prevention and cure of hyperthyroid states. The importance of rest in those individuals who present the aspects of "autonomic imbalance," especially if thyroid hyperplasia coexist, cannot be too strongly emphasized. Undoubtedly many cases of exophthalmic goitre can be prevented if proper measures are taken before advanced hyperplasia has taken place in the thyroid gland. Once exophthalmic goitre becomes well established, the clinician is confronted with a complex situation in which perverted physiology and biochemical changes have occurred in the entire somatic system, especially, the cardiovascular and nervous apparatus.

The use of the calorimeter has contributed much to our knowledge of thyroid disease. I do not believe that one is justified in resorting to any form of destructive therapy without careful and repeated metabolic readings. The diagnosis of exophthalmic goitre is incomplete without this information, for it must rest upon the presence of two main groups of findings: First, those symptoms resulting from the superactivation of the autonomic nervous system, manifested by tachycardia, nervousness, tremor, sweating, diarrhea, and at times, exophthalmus; and, secondly, by increased catabolic physiology manifested by loss of weight and increased basal metabolism.

There exists a sub-group of hyperthyroidism, toxic adenoma, which has certain clinical characteristics justifying a separate classification. The onset is insidious, the sympatho-mimetic symptoms being mild but progressive, and it is in this type that serious cardiac complications are prone to overshadow the thyroid picture. Paroxysmal auricular tacychardia, fibrillation and flutter are of frequent occurrence. Congestive heart failure supervenes early so that many cases are treated as primary cardiac disease. This group is of immense clinical importance, for the results are brilliant when the thyroxin intoxication is reduced by lobectomy.

From the viewpoint of the clinician, there are many problems concerned in the therapeutic control of exophthalmic goitre of equal importance to those destructive measures directed at the gland *per se*. The maintaining of an efficient cardiovascular apparatus in the event of surgery, the institution of proper physical and mental rest, with the use of diets poor in proteins and fats, are all problems of no small importance.

The use of Lugol's solution to precipitate a reduced metabolic rate in exophthalmic goitre is one of the noteworthy therapeutic contributions of recent years.

The control of hyperthroidism is a problem with many angles. A thorough and comprehensive knowledge of the complex nature of the disease must form the basis for any rational therapeutic effort. Surgery has its role; X-ray, its place; but, above all, there must be co-operation and team work, for disappontment and failure will surely befall the single-handed adventurer.

The parathyroid is of clinical importance in so far as it is apparently connected with clinical tetany. Tetany is a syndrome observed in various conditions, but there is a more or less established disturbance of metabolism in all types. This chemical alteration in the body fluids is either a diminution of ionized calcium or a marked increase in the alkali reserve with the production of an alkalosis. More experimental work is needed to establish the true relation of the parathyroids to these chemical alterations in body fluids. It suffices to say that the treatment of tetany should have a broad scope, depending mainly upon calcium administration to relieve the hyper-excitability of the neuromuscular apparatus and not upon parathyroid feeding.

The relationship of the pituitary gland to

XUM

clinical medicine is in a very uncertain state at this time. Much data, previously presented as trustworthy and cardinal, is being questioned and proven incorrect. We know little or nothing of its actual physiology, and, consequently, its relationship to disease is hypothetical. Even the relationship to acromegaly cannot be substantiated since, were this affection the result of a perverted secretory activity, the result could neither be unilateral nor localized. The supposed relationship to symptomatic diabetes insipidus has been practically controverted; the true lesion being found in the basal ganglia of the brain.

It is generally accepted that the anterior lobe of the pituitary gland is chiefly concerned in maintaining and regulating body growth, particularly of the skeletal portion, and in entering into the metabolic activity concerned in the establishment of puberty and sexual maturity. The posterior lobe is assumed to be active in the production of a powerful autacoid which is closely concerned with the physiologic activity of unstriped muscle, while the pars intermedia is believed to be associated with the posterior lobe in the production of this autacoid. One cannot accept these statements without considerable reservation, since literature abounds in clinical and experimental evidence which cannot be wholly reconciled to this belief. The relationship of the various disturbances of the generative organs, especially, those associated with skeletal malformations and irregular adiposity to disturbed pituitary function, rest on very unconvincing data. At any rate, slight evidence has been presented showing that pituitary feeding will influence the course of such conditions.

There exists, no doubt, in the minds of the most conservative, the thought that many diseases are directly traceable to disturbance of the endocrine system. Many of these have well established clinical characteristics. This statement is applicable to all glands having an internal secretion, yet, there are certain facts pertaining to these gland products which have not been properly evaluated. When one attempts to catalogue the various physiological activities of the members of the endocrine system in the living organism, due consideration must be given to the difference between the pharmacological and physiological properties of these gland extracts. For instance, adrenalin chloride will relax the spasm of the bronchial tree in allergic asthma. From this observation one might surmise that the suprarenal gland controlled this musculature, hence, bronchial spasm should be a constant finding in suprarenal insufficiency occurring in Addison's disease. We know that bronchial spasm is not a part of the clinical picture of Addison's disease, hence the action of adrenalin chloride in this instance is pharmacological and alien to the true physiological action of the gland in the organism. Furthermore, it is entirely probable that few of the gland products are able to withstand gastric and pancreatic digestion. We know this is applicable to suprarenalin, insulin and pituitrin. We cannot reproduce any of the pharmacological action of pituitrin by feeding experiments with the posterior lobe of pituitary gland. The logical conclusion is therefore that such products never reach the tissues except as by-products of digestion which undoubtedly destroys their hormonic properties.

Lastly, why do we prescribe two grains of pituitary extracts and one-tenth of a grain of parathyroid extracts as a dose for clinical use? Has any method been used to standardize the dosage? The only reason I have been able to discover is that the pituitary gland is ten to twenty times larger than the parathyroid gland.

The clinician attempting to solve for himself the problems in question, with the aid of modern physiologic literature, finds himself in a maze of contradictions contributed by able men, but which nevertheless leave an impression of unreliability. Experiments in normal animals fail in a large measure to solve the clinical problems observed in patients, especially, those suffering from endocrine disturbances. Francis Bacon's conception of scientific procedure contemplated an exhaustive and minute observation of natural phenomena prior to hypothesis. I fear the modern endocrinologist short-cuts the observations by proceeding under ingenuous guesses, which in a large measure is responsible for the present chaotic state of the whole subject.

Lewis-Gale Hospital.

Let the one who sighs for comfort
Feel a hand-grasp true;
It will cheer the way and surely
Can't impoverish you.

Lives are human though so often
We disguise our pain;
Some are hungering for your comfort
Give and give again.

—*Selected.*

ENDOCRINOLOGY: ITS RELATION TO GENERAL SURGERY.*

By P. W. BOYD, M. D., F. A. C. S., Winchester, Va.

The most fruitful field for research for the surgeon today is the endocrine gland. Scattered throughout the body are a number of ductless glands, the thyroid, thymus, parathyroid, pituitary, tonsils, adrenals, spleen, ovaries, and to a certain extent the testicles, whose functions are products of internal secretions. We have clinical and experimental evidence that the individual gland secretes such a product.

The isolation of the secretion of any one gland has not been accomplished although the glands themselves have been analyzed and placed upon the market commercially as products of the thyroid, suprarenal, parathyroid, ovaries, etc. That the glands do secrete is a recognized fact and the glands have a reciprocal relationship.

The secretions of these glands have a far reaching effect upon the development and maintenance of the equilibrium of both the body and mind.

Get into mind that they are subject to two extremes of functional perversion, one an over-secretion, hyperfunction, and the other an under-secretion, hypofunction. If there is a condition of dysfunction there is no scientific proof that any of these glands do under any circumstances secrete an abnormal or perverted substance.

It is interesting to note that these perversions of secretions produce the extremes of disturbance upon the body and mind. For instance, a hyposecretion of the pituitary gland in infancy may lead to true dwarfism, while a hypersecretion of the same leads to giantism.

Hypersecretion of the thyroid produces tachycardia, hypersensitiveness, high blood pressure and extreme nervousness and irritability. While a hyposecretion produces mental dullness, lethargy and sluggishness of the circulatory system.

Abnormal functioning of these glands manifests itself in proportion to the age of the subject. The removal of the ovaries or testicles in childhood will effect much more profoundly the subsequent development of the subject than if removed during adolescence. Again, removal of the same during adolescence will cause more disturbance than if removed in adult life.

It seems as though many of these ductless glands have their greatest period of activity during development. And any perversion of function at such a time is prone to result in an overgrowth or an arrested development of mind or body.

We have believed these many years that the ovaries and testicles do not begin their functions until about puberty, when they manifested their activity by evidence of sexual passion. But long before puberty there is an internal secretion emanating from the testicles and ovaries which goes far toward the making of those qualities which characterize the man and woman, such as bravery, ambition, courage, the desire of a home and children.

The associated organs of the ovaries and testicles, as the uterus and prostate, respectively, are thought by many to have an internal secretion which influences the body. The ovaries influence the mammary glands as well as the uterus, and likewise control the mammary gland. Surgeons at an earlier period were especially prone to extirpate the ovaries. Then came the period of conservatism not to unsex the patient except in direct necessity. This seems to be most logical. Though after the extirpation of the uterus the retention of the ovarian tissue has little or no physiological value and may be of serious harm to the patient, thus giving evidence that there is a break in the utero-ovarian functional harmony, upsetting the internal secretion of these glands.

Many a time an ovary can be saved by transplantation, or otherwise. When both ovaries must be sacrified in a woman in her twenties, remove the ovary, placing it in a solution of normal saline until the necessary work within the abdomen is completed. Then split open the ovary and place it outside the peritoneum, just beneath the rectus muscle. The menstrual function is preserved and the woman's nervous system is not upset. The internal secretion furnished by this endocrine gland is retained, she is not deprived of a material loss of development, nor of her womanhood or sexuality. After forty-five years of age the removal of both the ovaries scarcely renders any appreciable change in her mental, moral, or physical well-being if the uterus is left intact.

In reviewing the glands with special reference to their clinical bearing, both medically and surgically, the medical treatment takes the form of organotherapy. And we all know the value of the thyroid and the adrenal and

*Read as part of the symposium on Endocrinology at the meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

XUM

pituitary products. There are also on the markets products from the testicle, ovaries, corpus luteum, pineal and parathyroid glands. But these have no definite clinical basis as yet.

Medical treatment consists of the administration of the gland to replace a hypofunctioning gland. It may also be given for its hormonal relationship or action. There is as yet no medical treatment for hypersecretion of any of the glands.

The surgical treatment sums itself as follows:

First: In hypofunction we resort to transplantation of the glands;

Second: In hyperfunction, extirpation, total or partial. Again we may use any of the operations which diminishes the secreting power of the gland, as vessel ligation, destruction of the gland, tissue, etc.

We have a number of the products of glandular internal secretions which are used surgically and are of established importance; for example, the products of the suprarenal glands or pituitrin. They have not only medical value, but are used surgically in infiltration and local anesthesia, as is adrenalin. We also have a surgical and obstetrical pituitary extract of value in surgical cases, such as intestinal paresis, loss of tone of the bladder and even the stimulation of the heart and vital centers.

In the treatment of tetany which is thought to be a hypoparathyroidism there are two surgical methods:

First, intravenous injection of five per cent solution of calcium lactate or, which in some instances acts better, 20 c.c. of a ten per cent solution magnesium sulphate. It should be given early and in heroic doses.

Second, the transplantation of the parathyroid glands. Auto-transplantation has been shown by Halsted to be feasible and successful.

We are further advanced in the treatment and pathology of the thyroid gland than any of the endocrine glands. It is one of the most important organs in the body. It regulates the development of the bone, distribution of fat, plays an important part in menstruation, has much to do with the sexual function, and in unsuspected ways has an important part to play in human economy.

If the secretion is excessive, hyperthyroidism, the catabolic changes of the body are rapid. The subject shows a loss of weight, tachycardia, muscular weakness, tremor, sweats, mental irritability and characteristic symptoms. If the secretion is deficient, hypothyroidism, the body metabolism is depressed. Everything is at a low ebb. The infant does not develop, becoming a typical cretin. The cause as yet is unknown, though we do know that focal infection from other parts of the body is a decided factor as to thyroid disturbance.

The geological deficiency of iodine seems to be another factor in endemic goiter. Heredity must play some part in causing it as we so frequently see goiter in several members of the same family.

Most all forms of goiter are suitable for operation if causing symptoms, or deformity, or increasing in size rapidly.

We must make careful distinction between the young patient and the middle aged patient. The thyroid gland is absolutely essential to normal development during the period of active development. And the entire gland cannot be removed at this period of life without the risk of an arrested mental development. The risk becomes appreciably less after each decade, until at forty-five or fifty years of age the entire gland can be removed with but slight risk of disaster.

The thymus has a limited existence of principal functional activity and that is during the early period of life. In its existence, two phases are recognized, as in other endocrine glands, one of progression the other of regression. The life of the gland and its functional activities vary at different periods of existence. Remnants of thymus tissue are present in adult life, and even in old age more frequently than we formerly recognized.

Involution begins at birth or in the first year. The thymus attains its most rapid growth toward the end of the second year. The most important biological epoch is to be looked for between the first and the third year of life. Under normal conditions it will continue to develop until the twelfth or fourteenth year. In advanced age the thymus is in evidence.

It is an important organ during the period of active growth. Its function is concerned with general development and particularly with the ossification of bone. The gland frequently undergoes pathological changes, the effects of infectious diseases, malnutrition, exhaustion, etc. X-rays cause a similar result,

effecting principally the lymphatic element of the organ.

The mechanic theory of sudden death from pressure due to enlarged thymus seems to have been too frequently applied. It is evidently possible in a weak, helpless infant, but in strong children and adults it is now practically excluded.

However, the enlarged thymus can cause respiratory and circulatory disturbances. This is strongly supported by clinical observation plus immediate relief when operated upon. Operative treatment of enlarged thymus is giving the best results. The intracapsular thymectomy is the operation of choice. X-ray has given some remarkable cures and is advisable in children before puberty.

Parathyroids: Latent tetany often becomes active after operations of any kind. Sometimes it is brought on by acute infections, nephritis, menstruation, etc.

We must not be too prone to ascribe all diseased conditions to the action of bacteria. Such emotions as hatred, anger, jealousy and discontent often cause disease. These emotions cause a steady increase of internal secretions from certain of the ductless glands which in time disturb the equilibrium of health and throw the balance on the side of disease.

In determining the delicate question whether or not an offending structure or organ should be removed, the surgeon is called upon to render a verdict fraught with heavy responsibility. You are to determine two points:

First, if the patient will survive the operation; and second, what will be the future state of health and physical usefulness of the subject if a certain organ is removed? As surgeons we must inform ourselves regarding the function of these glands before we take the responsibility of disturbing their action.

When good judgment is supplemented by good surgery the results are very gratifying, not only to the patient, but to the profession.

ENDOCRINOLOGY: ITS RELATION TO PEDIATRICS.*

By W. L. HARRIS, M. D., Norfolk, Va.

In a short paper, such as is expected in a symposium of this kind, it is possible to present only a very brief outline of some salient points of endocrinology in its relation to pediatrics.

*Read as part of the symposium on Endocrinology, at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

In reviewing the literature on the subject, one is impressed by how much is written and how little of it is of any real value. There are a lot of vague, fanciful and fantastic theories on the subject but, from the knowledge we have of the thyroid and pancreas, it is only reasonable for us to expect that in the near future, we should have a more exact knowledge of the functions of the other glands of internal secretion.

Unfortunately, the over enthusiastic have, no doubt, done the subject great harm, temporarily at least, by their extravagant claims, but I think the greatest offenders along this line are the over enthusiastic manufacturers, who are trying to find a market for their preparations. These men have been able to elicit the help of certain doctors and pseudo-doctors and have induced them to write articles making all kinds of extravagant claims that have no basis whatever in scientific fact.

Our knowledge of the exact functions of the various endocrine glands is at present very limited and this impresses itself upon us very forcibly when we have some obscure condition of growth, development or metabolism to deal with, and when reasoning from analogy we feel that the glands of internal secretion must be at fault.

It is interesting to contrast the views of the enthusiast and the skeptic upon the subject of endocrinology and organotherapy. L. Vincent, of London, 1923, after a critical review of the "present position of organotherapy" concludes: "There is no subject upon which so much utter nonsense has been talked as internal secretions and organotherapy, or at any rate, a larger part of it may be defined as the application of this nonsense to the practice of medicine. In the meantime, certain firms of manufacturing druggists are making the most of a unique opportunity and are growing rich by reason of the inadequate education of the medical practitioner and the notorious ignorance of the public on all matters relating to their own bodies."

To the pediatrician, endocrinology is almost entirely limited to the phenomena of growth and development, but the ultra-enthusiasts can see more than this and claim that they can see either a hyperfunction, hypofunction or a dysfunction of one or more (usually many) of the various endocrine glands to account for almost every conceivable ailment with which

children may be afflicted, and that if you give a certain glandular extract for a while and see no beneficial results therefrom, add a little of some other gland—one or more, and continue for a long period of time. If the patient eventually gets well or improves, full credit should be given to the treatment, at the same time ignoring the natural tendency of so many morbid conditions in children to improve—not only without treatment of any kind, but in many cases, in spite of treatment.

The extravagant claims made for so many forms of glandular therapy have no well established facts upon which therapy of this kind can be accepted.

There are only two of the endocrine glands about whose function we know very much, the knowledge of which is of real help to us in pediatrics. I refer, of course, to the thyroid and pancreas. If we feed a cretin thyroid extract or its active principle, thyroxin, we get a prompt and most wonderful demonstration of a substitutional organotherapy. In diabetes, the disease in pediatrics for which we formerly could do almost nothing, we now feel that we can keep these little patients alive and very happy for years, with the aid of insulin. How long this treatment may prove of benefit, we do not know, as insulin has been in general use only about two years.

We can make no such claim for any other of the extracts of glands of internal secretion. The pituitary and adrenals afford us most powerful extracts, but up to the present these do not seem to take the place of the glands themselves, as is the case with the thyroid and pancreas. None of the other glands of internal secretion furnish us any extracts that are of much help in pediatrics.

In considering the value of our knowledge of endocrinology in its relation to pediatrics, we should constantly be on our guard lest we allow our enthusiasm to get ahead of our knowledge of the subject and attribute all kinds of morbid conditions to disturbances of the functions of the various endocrine glands, and likewise attribute any beneficial results to the use of the various glandular extracts that our fancy may prompt us to use, and lose sight of the facts that much can be accomplished by time, proper attention to diet, sunshine, exercise, etc.

Take, for example, the over-fat child. This trouble may be due to a hypothyroidism or some dysfunction of the pituitary, or to both. If, after months of proper dieting and exercising, while giving thyroid extract and pituitary extract, the patient's condition greatly improves, do not be too sanguine that the organotherapy did it all, for such cases sometimes show the same improvement without drugs.

It may be easy for us to fool ourselves in therapeutic tests unless we have similar cases for controls. It is exceedingly hard for us in disturbances of the endocrine glands to really recognize and properly interpret the symptoms or signs due to the deficiency of secretion of any single gland. At times it is hard to differentiate between morbid conditions due to deficiencies of secretions of the internal glands and deficiencies in growth and development and other morbid conditions due to want of a properly balanced diet, sunlight, etc.

We could go into a discussion of the supposed functions of the various endocrine glands and the morbid results occasioned by a disturbed function, but so little is as yet proven knowledge, our theories may be changed at any time and it would amount to little more than mere speculation.

However, even our limited knowledge of the functions of the endocrine glands has already helped us to understand and properly interpret a great many conditions of which we formerly knew little or nothing, and organotherapy based upon this knowledge is taking its place in therapeutics. Howland says, "In order that any system of therapy may survive, it must be based upon scientific facts and must be developed as a result of logical interpretation and utilization of such facts."

540 *Monroe Building.*

ENDOCRINOLOGY: ITS RELATION TO GYNECOLOGY.*

By STEPHEN H. WATTS, M. D., F. A. C. S., University, Va.
Professor of Surgery and Gynecology, University of Virginia.

I take part in this discussion with the diffidence of a man who realizes his lack of knowledge of the subject and his limited experience with it.

Although we know as yet comparatively little about the secretions of the individual endocrine glands and still less about their interrelations or combined actions, no one may question the great influence of these glands on important physiologic processes. The over-

*Read as part of the symposium on Endocrinology at the meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

enthusiasm of certain endocrinologists and manufacturers of glandular remedies who extol the virtues of pluriglandular therapy have perhaps lessened the respect of some of us for endocrinology, but who has not been thrilled and encouraged by the recent discovery of insulin and the wonderful results which it has already accomplished? It behooves us to keep an open mind and do what we can to further the knowledge of this very complex subject by well planned and carefully executed clinical and experimental investigations.

There has been considerable discussion as to whether the hormones produce their effects directly on the tissues of the body or indirectly through the autonomic nervous system. It seems likely that some function in the one way and some in the other. Some may even work on the principle of detoxication.

Since this paper deals with the endocrines in gynecology we will review as briefly as possibe the modern conceptions of the physiology of the ovary. In this review we have made free use of the section in Graves' Gynecology dealing with the subject.

That the ovary produces an internal secretion is proved by the evidence gained from observations made after removal, from transplantation of ovarian tissue, and by the effects of injection of ovarian substances into the tissues.

The exact nature of the internal secretion is not known nor is it known in what part of the ovarian tissue the substance is produced, however, it seems most likely that it is formed in the corpus luteum and the follicle apparatus. Since the ovarian secretion is known to exist before puberty, as shown by changes in development after castration before maturity, it seems likely that the follicle apparatus must be the seat of manufacture, for the corpus luteum does not appear normally until sexual maturity. It seems probable, therefore, that the follicle apparatus has a great deal to do with the growth of the genitals and general body development at least up to the time of puberty.

In addition to the follicle apparatus the corpus luteum, which is formed from the granulosa cells lining the follicle, is thought to produce an important internal secretion. The corpus luteum, which histologically somewhat resembles the adrenal cortex, does not form until the age of puberty and with its appearance come the cyclic changes of menstruation and the possibility of fecundation. Fraenkel suggested that the effect of the internal secretions of the corpus luteum is a preparation of the uterus for the insertion and development of the fertilized egg, menstruation taking place in case of failure of impregnation.

Leo Loeb has confirmed by experiments the theory that the corpus luteum inhibits ovulation, and has shown experimentally that ovulation may be accelerated by the removal of the corpus luteum. The absence of ovulation during pregnancy is thus thought to be due to the continued presence of the corpus luteum. Loeb has also demonstrated experimentally the influence of the corpus luteum on the decidual reaction of the uterine mucosa. If the uterus of a non-pregnant animal is incised or the mucosa mechanically irritated at the time during which the corpus luteum is elaborating its "growth substance," a very marked reaction is produced in the uterine mucosa.

Edward Ochsner says that veterinarians have observed that if a false corpus luteum remain unabsorbed in either ovary of a cow she does not come in heat, and so long as she does not come in heat she, of course, does not conceive. On the other hand, as soon as this false corpus luteum is absorbed normally or expressed manually by the operating hand of the veterinarian, the phenomenon known as heat invariably develops within forty-eight to one hundred and twenty hours. Ordinarily the true corpus luteum is retained in the ovary of the cow from thirty to seventy days after parturition. This statement is based upon the following facts: First, usually the cow does not come in heat for this period after calving; second, the true corpus luteum can be felt by the operating veterinarian for approximately this length of time; and finally, when this true corpus luteum is expressed the cow will invariably come in heat within forty-eight to one hundred and twenty hours. This fact is made use of by veterinarians to get valuable cows to produce a larger number of calves. He also states that expression or excision of the false corpus luteum in the human female causes menstruation in from twelve to thirty-six hours in every case. The expression or excision of the corpus luteum of pregnancy is very apt to produce abortion.

That the corpus luteum is not the sole source, or even the most important source, of the internal secretion of the ovary is evident from the fact that during the period of sexual immaturity in which the internal secretion is

performing a very important function the corpus luteum is wanting.

The ovary contains certain connective tissue cellular elements called "interstitial cells" which correspond to the cells of Leydig in the testicle. Successive investigators have found these cells in numerous species and finally in apes and human beings. They occur with great inconstancy, in some species appearing in separate gland-like masses, in others as scattered cells. In some animals they are most prominent during the spring of the year or during the season of rut. Some recent investigators claim to have shown that the interstitial cells become more highly developed after roentgenization of the ovaries, while in the male it is said the homologous cells of Leydig undergo a like development as a result of vasectomy.

Limon was the first to recognize their origin from the lutein cells of the theca interna of the atretic follicles and this view is generally accepted. The internal secretion of these cells is thought to influence the development of the secondary sex characteristics.

Frank, however, has recently said that the "interstitial gland" does not exist in the human being and ascribes the development of the female duct system, from an indifferent anlage, to the evolution of the ovarian follicle, which begins as the primordial follicle, is called a graafian follicle as it ripens, and, after ovulation or bursting has taken place, completes its cycle of existence as the corpus luteum. He thinks the transformation of the infantile genital tract, inclusive of the secondary sex characters, to the adult stage results from a quantitative increase in ovarian secretion.

In this connection a recent article by Allen and Doisy from Washington University at St. Louis on "An Ovarian Hormone," giving a clean cut method of testing its efficacy is of great interest. It has been recently shown that the estrual cycle of mice and rats can be accurately established by microscopic examination of the vaginal scrapings. During the anabolic phase of the cycle in these rodents, the epithelium of the vagina grows to a considerable thickness and a cornified layer similar to that in the epidermis develops. During the catabolic phase the outer layers of this epithelium degenerate and are removed by leukocytic action. These changes provide a definite succession of cell types in the vaginal lumen, each one characteristic of a certain phase of the cycle. Thus the microscopic examination of vaginal smears is a reliable indicator of the estrual condition of the living animal. As a source of hormone Allen and Doisy used the liquor folliculi from the ovaries of hogs and cattle. It was found that from forty to forty-eight hours after the injection of this fluid into spayed rats and mice the animals were in full estrum as shown primarily by the vaginal smears, but these results were checked by an examination of the uterus and vagina which were in the typical hyperemic condition characteristic of estrum. When the contained cellular elements and the fluid of the liquor folliculi were separated it was found that the hormone was in the fluid proper. It was found possible to fractionate this liquid so that an apparently protein-free, active substance was obtained.

Not only were the uterine changes of estrum produced but also growth in the mammary glands, and during the induced estrum the animals mated in a normal manner. Evidence was also secured of hastening of sexual maturity, as animals which had been injected with follicular extract attained puberty and mated twenty-two to forty days before they normally would have done so. At the time of publication the authors had obtained no result from the injection of extracts of corpora lutea, of whole ovary, or of ovarian residue from materials obtained from three of the largest manufacturers of biologic products.

Hypofunction of the Ovaries.—When the ovaries are removed in early life, normal development of the genital system is prevented and changes are produced in some of the other ductless glands, notably enlargement of the anterior lobe of the pituitary gland, which may account for the skeletal changes and adiposity in such cases. Early castration in women is apparently followed by an increase in body length, atrophy of the genitals and lack of development of the secondary sex characters including the breasts.

Castration after maturity, especially after sexual life is fully developed, does not give rise to the profound changes and marked symptoms formerly supposed. The permanent changes are cessation of menstruation and local atrophy of the external genitals, which is usually not sufficient to cause any distress. The temporary changes are vasomotor and possibly some nervous disturbances. The vasomotor disturbances are not constant, being said to

occur in about eighty per cent of cases. They are usually of temporary duration, lasting only a few months, but may last several years. Removal of the ovaries probably causes little or no impairment of sexual sensibility after it has been normally established. It is hardly necessary to say here that there is no basis for the popular idea that ovariectomy is followed by a reversion to the male type, manifested by a deep voice, the appearance of hair on the face, and the acquisition of male instincts.

We know very little about the effects of different grades of ovarian hypofunction. It is probable that certain cases of amenorrhea and scanty menstruation are due to this cause. Infantilism is probably not a manifestation of primary ovarian hypofunction.

Hyperfunction of Ovaries.—The so-called myopathic hemorrhages, which are most apt to occur about the time of puberty or the climacteric and for which no definite anatomic basis has been found, are now thought to be due to ovarian hyperfunction as they respond so well to radium and X-ray treatment, which apparently produce their effect through action on the ovaries. Other cases of bleeding associated with definite anatomic changes, such as myomata, chronic endometritis, glandular hypertrophy, chronic metritis, etc., are also thought to be due to hyperfunction of the ovaries.

As stated above we know very little about the correlation of the ovary and the other glands of internal secretion.

The close physiologic relationship between the thyroid and ovaries is apparently shown by the frequent enlargement of the thyroid at puberty and during pregnancy; by the prevalence of menstrual disturbances accompanying both hypofunction and hyperfunction of the thyroid; by the fact that complete thyroidectomy is followed by atrophy of the uterus; because deficiency of the thyroid in the very young or removal of the thyroid in early youth or in young animals prevents the normal development of the genital organs.

As regards the pituitary there seems to be an interrelationship between the secretion of its anterior lobe and that of the gonads. Various experiments have shown that a deficiency of this lobe in the young causes a condition of permanent genital infantilism, while in the adult it produces atrophy of the genital apparatus. Over-activity of the anterior lobe is associated with over-activity of the sex glands. By feeding extracts of this lobe to animals Goetsch claims to have produced premature development and increased activity of the genitalia. Frank and others have not been able to obtain these same results by the feeding of anterior lobe extracts.

The enlargement and possible over-activity of the pituitary following castration has been mentioned above.

Hyperfunction of the pars anterior before maturity is supposed to give rise to gigantism and after maturity to acromegaly. In the early stages of these conditions there is an over stimulation of the sexual apparatus which is followed later by decreased function, probably due to degenerative changes in the pituitary gland.

The close embryologic relation of the adrenals to the sex glands is well known. This association is supported clinically by the fact that in some cases of sexual precocity the adrenal cortex has been shown to be hypertrophied, while certain non-destructive tumors of the adrenal cortex in young children are generally associated with premature development of the secondary sex characters. Moreover, hypertrophy of the adrenal cortex occurs during pregnancy. In hyperplasia of the adrenals changes are said to occur in the testicles, particularly in the interstitial cells. No relationship has yet been established between the adrenal medulla and the sex organs.

The thymus is thought by some to exercise a restraining influence upon the sex glands in early life, but this has not been proven; in fact some go so far as to say that the thymus does not produce a hormone.

Carlson who takes a very conservative attitude concerning the correlative action of the different endocrine glands says: "The failure of gonad function in hyperthyroidism is probably due to the profound disturbance of metabolism. In cretinism and myxedema, there is evidence of degeneration or atrophic changes in most of the organs of the body. It is well known that drepression of the gonads is a frequent effect of metabolic disturbances from faulty diets, as well as from chronic maladies resulting in cachexia. The failure of gonad function in frank hypopituitarism may also be due to the general impairment of growth and metabolism; but this is less certain, because the disturbance of metabolism in hypopituitarism is less profound than in hypo-

XUM

thyroidism. But we are not justified in interpreting the fact in the sense of a direct stimulation of the gonads by pituitary hormones, since pituitary feeding seems to have no influence on gonad development and acromegaly itself may be accompanied by gonad depression rather than the reverse. At present, there is no evidence that hypoactivity or hyperactivity of any endocrine system, outside of the specific gland involved, can produce or prevent diabetes, myxedema, Addison's disease, infantilism or acromegaly. Despite this fact, the thyroid-pituitary-pancreas-suprarenal-gonad group will probably continue to be a favorite exercise ground for speculative physiology and therapy in regard to mutual hormone control."

Ovarian Transplantation.—That the ovaries produce an internal secretion seems to be conclusively proved by the results of implantation and transplantation of ovarian tissue. Experiments in apes have shown that the ovaries may be excised and replanted with preservation of menstruation. It is likewise known that transplantation of ovarian tissue may preserve the menstrual function in women. A number of cases are reported in which transplantation of ovarian tissue into the uterine cornua has been followed by pregnancy, moreover in a very few instances heteroplastic transplantation is said to have resulted in full term pregnancies.

When menstruation takes place after transplantation it usually appears in two or three months, apparently after the transplant is well vascularized. Menstruation may continue for several months or several years after the transplantation but the transplant shows a great tendency to undergo degeneration. Autoplastic transplantations are naturally the most satisfactory but ovarian tissue which is so diseased as to require removal is hardly suitable for transplantation into another part of the body. When we consider how unsatisfactory are homo- and heteroplastic skin grafts we would expect little result from such grafts in the case of a more highly organized tissue like the ovary. Ovarian transplantation has been done by numerous operators to avoid the ablation symptoms after oophorectomy and some have reported encouraging results but the majority have found the results very unsatisfactory. Graves thinks ovarian transplantation may possibly be of value in the functional amenorrhea of young women.

Martin, who from time to time has thoroughly reviewed the subject of ovarian transplantation, has reached the following conclusions:

"1. Clinically, there is very little to encourage one to believe that transplantation of ovaries as practiced up to the present time has more than speculative value as a surgical procedure.

"2. There is some evidence that autotransplants are of some value in deferring the symptoms of the menopause and delaying the cessation of menstruation. It is difficult, however, not to attribute some of this evidence to suggestive therapeutics or to unattached ovarian tissue left *in situ*.

"3. There is practically no convincing evidence that homotransplants have been successful in the human female.

"4. There is no evidence that heterotransplants have been successful where the human female has been the recipient.

"5. There is some encouraging evidence recorded in experimental animal surgery that not only autotransplants, but homotransplants and even heterotransplants have been successful and the sexual function of the castrated animal maintained."

Ovarian Organotherapy.—In spite of the widespread use of ovarian products in gynecology, any exact knowledge of their utility and of indications for their use is very slow in developing. This is doubtless due to a number of factors: primarily our lack of knowledge of the ovarian hormone; the lack of standardization of the ovarian products; the lack of any exact measure of effect such as basal metabolism determinations after the administration of thyroxin and estimations of the sugar in the blood and urine after giving insulin; the use of old, inert preparations; the giving of too small doses over too short periods; the possibility of the active principle being destroyed when administered by mouth.

The products most frequently used are extracts of the whole ovary, corpus luteum extract, and ovarian residue, which is the ovarian tissue after removal of the corpus luteum. These are prepared by most manufacturers in very much the same way, namely, the ground tissue is dried at low temperatures, powdered and sold in the form of tablets or capsules. Formerly, some manufacturers defatted the materials to increase their keeping qualities, but this has been largely given up since some

importance has been attached to the ovarian lipoids. The dosage is the same whether corpus luteum or ovarian extract is given, 5 gr. three or four times daily. In most of the preparations now used 1 gr. of the extract represents 6 or 7 gr. of the fresh ovarian substance.

In recent years a good deal of importance has been attached to the corpus luteum as the source of the internal secretion of the ovary and corpus luteum extract has been much used. Graves, however, claims to have gotten better results with ovarian residue and calls attention to the probable importance of the atretic follicles in the production of this secretion. The experiments of Allen and Doisy with liquor folliculi, mentioned above, would seem to indicate that whole ovary or ovarian residue are preferable to corpus luteum extract. The ovarian preparations have been used chiefly in the treatment of the vasomotor and nervous symptoms of the artificial and natural menopause, functional amenorrhea, and dysmenorrhea. The clinical reports on their use are generally unsatisfactory, in fact for the most part worthless. In many instances the cases have been poorly studied, different preparations have been used in the series reported and unwarranted conclusions have been drawn. We should remember that in many of these cases our only measure of effect is the subjective symptoms of the patient, and bear in mind that some of the good results may be due to the psychologic effect of the treatment.

My personal experience with these preparations has not been sufficient to allow me to draw any conclusions of value. This experience on the whole has been rather disappointing and I do not prescribe them with any great confidence in the results. I have had some apparently very good results from the use both of ovarian extract and corpus luteum extract in the vasomotor disturbances of the artificial and natural menopause but, on the other hand, I have had cases which have shown no improvement from the same treatment.

Many others, however, report distinctly good results in this class of cases, notably Graves with ovarian residue and Burnam with corpus luteum extract. Graves and others report very satisfactory results from the treatment of functional amenorrhea and scanty menstruation in young women with ovarian extract, and Graves has found this treatment fairly satisfactory in pruritus, kraurosis, furunculosis, and other affections of the vulva in elderly women where the local disturbance of the parts is due to inadequate circulation. The results of the treatment of essential dysmenorrhea associated with under-developed or infantile uterus by means of ovarian products have not been encouraging.

Novak, in a recent review, expressed himself, after years of experience, as being distinctly uncertain regarding the value of ovarian organotherapy as we know it today.

For the present it would seem wise for the individual observer in practical work to adopt some one preparation of each gland and use that exclusively for considerable periods. In this way only will he be able to reach a just conclusion regarding the value of glandular therapy. The indiscriminate use of pluriglandular remedies has done much to bring endocrinology into disrepute.

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XUM

ENDOCRINOLOGY—ITS RELATION TO RADIOLOGY.*

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As has already been brought out, the general subject of endocrinology is one which is beset by many complexities and much of our present-day knowledge concerning it must rest upon bases more or less theoretical. In its discussion from the radiological standpoint there are certain phases to be taken up which are not yet capable of complete scientific proof, but there are likewise many valuable practical facts, both in regard to diagnosis and to therapy which have been absolutely proven to be true. It will be our particular aim to bring these proven facts to your attention with discussion as to their real value and also to comment to some extent on the phases which do not seem to rest on so firm a foundation of proof.

Our subject must include both diagnosis and therapy, for the efficacy of the agents which we are to discuss is well divided between these two departments. From the diagnostic standpoint it may be possible to obtain positive information with the roentgen ray, dependent sometimes upon enlargement of the endocrine glands, and in other instances where disordered secretion has produced demonstrable abnormalities in osseous development. Our therapeutic results depend upon the well-known inhibitory effect of the X-rays and radium upon glandular tissue. These effects are diametrically opposed to those desired from organotherapy. Administration of gland substance aims to compensate for undersecretion or hypofunction; radiation tends to reduce a hypersecretion and perhaps to reduce an accompanying hyperplasia of the glandular substance. We are well aware of the fact that endocrine disturbances are not by any means dependent upon the dysfunction of a single gland and that the ultimate analysis of most cases should include a consideration of all the glands and their mutually balancing functions, but the points to be brought out in this paper will be for the most part best taken up by discussing the different endocrine structures as separate entities. In the case of some of the glands our science of radiology is helpful from both the diagnostic and therapeutic standpoint, in some cases from one of these standpoints only, while some of the glands do not come within our own diagnostic or therapeutic provinces. Furthermore, in discussing the possibilities to be expected from radiology in helping to diagnose and treat disturbances in these glands, we will adhere as nearly as possible to those disturbances which have a direct bearing on the endocrine function.

*Read as part of the symposium on Endocrinology at the fifty-fifth annual meeting of the Medical Society of Virginia, at Staunton, October 14-17, 1924.

Thymus.

Without going into the questions concerning the functions of the thymus gland, it may be said that all observers who have studied the question of thymic hyperplasia seem to be of the opinion that this condition is much more prevalent than is generally supposed. Of importance is the recent report of Peterson and Miller who made a study of 120 new-born infants and found evidence of abnormal thymic enlargement in 43.3 per cent. They quote two other reports of studies of sixty and 119 cases, respectively, in which the incidence of enlargement was 48 per cent and 42 per cent. In this article the authors state that while both clinical and roentgen-ray diagnostic procedures were used, roentgen-ray evidence formed the actual basis for study. For reasons suggested below, it is believed possible that the incidence of positive cases may have been even larger than their paper would indicate.

In the diagnosis of this condition, general clinical evidence is of great value, but thoracic physical examination alone is extremely uncertain. Suspicious cases on being submitted to X-ray examination should give the following findings: If the gland is enlarged laterally, as is most commonly the case, there is a widening of the upper mediastinal shadow continuous with the heart shadow below and often indistinguishably merging with it. This shadow will be more or less typical in its appearance to those familiar with the interpretation of thoracic roentgenograms. It is possible, however, for enlargement of the gland to take place in an antero-posterior direction only, in which case the abnormal change will be invisible on the thoracic film. In the cases where lateral enlargement takes place, the amount of increase in size is not necessarily in proportion to the abnormal manifestations present. We may have definite X-ray evidence of marked thymic enlargement without clinical evidence of its presence, or we may have marked symptoms with little change in the thymic shadow.

Being lymphoidal in structure the gland responds quickly to the effects of radiation, and experimentation upon animals has shown that roentgen-ray exposures cause involution changes with amazing rapidity. This is borne out by clinical observations, so that for several years roentgen-ray treatment has been recognized as a specific for thymic hyperplasia and its distressing manifestations. The amount of radiation required is slight and the results are so brilliant that in cases where clinical evidence of thymic enlargement is present without positive X-ray evidence, radiation treatment should be instituted, the results of same constituting a therapeutic test. The X-ray has been the most usual form of administering the radiation, but more recently radium has been advocated as presenting certain advantages as to convenience of application.

Thyroid.

We shall omit any discussion of the diagnostic possibilities of the roentgen-ray in connection with the study of this gland as they have no direct bearing upon its endocrine function.

With the exception of malignant disease of the thyroid (which it is likewise not in order to discuss here), the disturbances of this organ properly treated by radiation therapy are manifested by hypersecretion and its resultant toxic effects. Thyroid adenoma with hyperthyroidism, exophthalmic goiter and hyperthyroidism without goiter or exophthalmos are the only abnormal thyroid conditions which are recognized as offering any response to the application of X-rays or radium. Therefore, our discussion here bears on the value of radiation therapy in hyperthyroidism. The two most pertinent questions in this respect would seem to be: (1) Does irradiation of the thyroid satisfactorily control hyperthyroidism? (2) If so, is it the best method at hand for producing the desired results? When it comes to a question of specific therapy, it is now admitted that we have only two methods of treatment to consider, namely, surgery and radiotherapy. Granting for the moment that either one of these methods will produce the desired results in a considerable number of the cases treated and that in the most favorable ones either surgery or radiotherapy is all that is necessary, there will be a large proportion of cases where the intoxication is so profound that adjuvant treatment is desirable. In the case of the patients selected for operation it may be largely in the shape of preliminary treatment, and in the cases where radiotherapy is chosen, other measures may be necessary in order to obtain the best results from this specific form of therapy. Among these measures may be mentioned: (1) rest in proportion to the severity of the disease; (2) diet of the proper kind; (3) treatment of cardiac, nervous and gastro-intestinal complications; (4) temporary or partial control of the hyperthyroidism by administration of drugs, particularly iodine; (5) removal of possible foci of infection as early as possible.

The above enumeration is made for the purpose of emphasizing that, in order to obtain the best results, other measures may be necessary than the particular form of specific therapy chosen, and that each case may present peculiar problems concerning the most advantageous method of its management.

Concerning the question as to whether radiotherapy has a curative effect in hyperthyroidism, the favorable results of some hundred or more investigators show this to be a positive fact. We have had considerable experience in these cases extending over the past few years and have now come to expect steady improvement to take place almost as a matter of course in most of the cases selected for irradiation, after the treatment has had proper time to begin to produce its effects.

Our own experience has been entirely limited to the use of the X-ray as the radiotherapeutic agent. At least a majority of the workers who have both radium and X-ray at their disposal seem to prefer the latter and it seeems to be the most logical of the two for employment here. The only record which we have found of any comparative tests with the two agents is a report by Burrows and Morrison, who give their comparative results in two series of 100 cases where radium and the roentgen-ray, respectively, were used, and the results obtained were vastly in favor of the X-ray.

The question as to the permanence of the relief afforded by this form of treatment has been often brought up. Only since the advent of the Coolidge tube has the technique of roentgen-therapy been at all standardized. Enough time has elapsed, however, for us to be able to state positively that actual permanent cures may be obtained. The effects produced may depend largely on the judgment,

XUM

technique and experience of the operator, and it is possible that the present technique will be subjected to future alterations.

The basal metabolism test is the recognized method of detecting hyperthyroidism and of observing the course of the disease. To use the words of Benedict, "this test, which was a physiological curiosity ten years ago, has now become a pathological necessity." In irradiation of the thyroid, our plan is to advise a metabolism test before each tri-weekly treatment. The clinical improvement of the case is usually concomitant with the decrease in the basal metabolic rate, but the test of the latter is an absolute index of the condition of the thyroid, provided the possibility of well-known sources of error are borne in mind. In steadily improving cases treatment is given every three weeks until the rate is normal, and radiation is never continued after this normal is reached.

Those who have followed this subject are familiar with the study which has been made at the Massachusetts General Hospital, where a so-called Thyroid Committee, consisting of surgeon, internist and roentgenologist, has daily studied the thyroid cases together, has determined on the treatment to be given each one and noted the progress of the cases already under treatment. A good deal of this work has been reported by Richardson, Means, Holmes and others. Briefly, their conclusion seems to be that in the cases of hyperthyroidism similar end results can be accomplished by X-ray treatment and surgery in groups of equal severity, though it requires longer to obtain good effects by means of radiation. About two-thirds of the patients radiated show either recovery or improvement concomitant with the treatment.

It may be said of radiotherapy that its administration is free from danger if properly applied, that there is no discomfort of application and no mortality. The statistics which come from some of the larger clinics show the surgical mortality in this class of work to be low, probably between three and four per cent. This represents work done under the most favorable circumstances, and the general mortality throughout the country will of course be somewhat higher. Surgical results are somewhat superior in the toxic adenomata to those obtained in the cases of exophthalmic goiter.

Just what groups should be treated by irradiation and which should be treated by surgery has not been definitely established, and neither procedure will effect recovery in all cases. We believe it reasonably conservative to say that early cases, including those of mild and of moderately severe toxicity, may be satisfactorily handled by radiation. If definite improvement does not occur in three months, radiation should not be further continued. Even this period should not be allowed to elapse in the very severely toxic cases where cardiac and other organic changes seem likely to occur, and some form of surgery should probably be resorted to. In cases where such changes have already occurred and which are therefore very poor operative subjects, a limited period of radiation may decrease the danger of operation. In regard to pre-operative irradiation, it has been said that this renders the operation itself more difficult on account of adhesions. That this is not the case has been noted by competent observers. Reports are not uncommon of cases submitted for pre-operative radiation in which the results from the radiotherapy rendered further treatment unnecessary. Cases where operation has been unsatisfactory may show response to radiation. Obviously the management of many cases may require close co-operation between internist, surgeon and radiologist. Radiotherapy of the thymus gland is thought to hasten the results of radiotherapy of hyperthyroidism on account of the possibility that the thymus is involved in the pathological process.

Pituitary.

The fact that much has yet to be learned concerning the exact functions of this gland and their relations to other endocrine activities must act as a hindrance to both diagnosis and therapy. In both these fields radiology plays a distinct part, although the scope of its diagnostic value has been the subject of much argument and its therapeutic possibilities have probably not yet been fully determined.

In the diagnostic field, there is the question of what constitutes the normal sella turcica from the radiographic standpoint. It has been agreed upon that the bony fossa which contains the pituitary gland may assume one of a number of different shapes and may vary in capacity to some degree, and still be within normal limits. A study of over one thousand X-ray films of the head in connection with the clinical work of Drs. Tucker and Gayle, with

careful measurements of the size of the pituitary fossa, tends to confirm the conclusions of Camp and others that the average anteroposterior diameter is about 11 mm., and the average vertical diameter 8 mm. Enlargement of the contents of the sella, if it be sufficient to exert continued pressure on the bony confines, will give X-ray evidence of its presence by more or less characteristic changes due to erosion of the walls or floor of the fossa. The enlargement may be due either to tumor formation with decrease in the secretion of the gland or to a true hyperplasia of the glandular elements with hypersecretion. In acromegaly, we have in most cases a fairly typical sellar enlargement, and with it other characteristic changes in the head, namely, large thick skull, coarse vessel markings, prominent brow with enormous frontal sinuses, square jaw, etc. There is a type of fossa seen which is diametrically opposed to the acromegalic; the capacity is small, the dorsum is low, the posterior clinoids extend sharply forward and unite with or closely approximate the anterior clinoids. This type of fossa is in our experience more commonly seen in heads which show general appearances opposite to the acromegalic, namely, small capacity, rather thin walls, fine markings, etc. These appearances may be associated with long standing or congenital hypopituitarism. A considerable number of cases of abnormal pituitary secretion will probably give no X-ray evidence of its presence.

Reports of beneficial results in the radiation treatment of pituitary lesions are beginning to be seen in the literature, especially in the cases of adenoma and other conditions manifested by hypersecretion. Treatment may be given by the X-rays externally or by radium implanted against the gland in explored cases of adenoma found to be inoperable. We have had little or no personal experience with this therapy, but it is founded on the susceptibility of adenomatous or glandular tissue to radiation. The technique of application will probably be improved as time goes on.

It has long been known that disorders of endocrine function have been responsible for various abnormalities of osseous development, and numerous studies have been made of these changes, particularly with regard to the alteration in the development of the bony epiphyses. The recently published work of Engelbach and McMahon, based on a clinical material of over 2,000 endocrine observations, seems to cover this phase of the subject far more thoroughly than any previous contribution, and these writers feel that roentgenological comparison of the bones of endocrinopathic and normal subjects of ages from birth to twenty-five years offers brilliant diagnostic prospects. They have studied the normal development of the whole osseous system roentgenologically. As different epiphyseal centers normally develop at different ages, they stress the point that according to the age of the patient a study of the particular centers which are normally ossifying or uniting at that age should be made to obtain the most information from the investigation. They report valable information from observation of retardation of bony growth in hypofunction of several of the glands, with other changes more or less characteristic of the gland in question, while in some conditions the bony growth is accelerated.

The adrenals, the pineal gland and the gonads will be mentioned briefly.

Discussion of irradiation of the adrenals has been largely confined to possible damage to these bodies and to their secretory activity by deep abdominal therapy for various abdominal conditions. That this may occur is believed to be true, and in administering roentgen treatment to the abdomen precautions should be taken to keep the adrenals out of the field of direct rays as far as possible, but the amount of damage likely to be done has not yet been accurately ascertained.

Concerning the gonads and the pineal gland there are some remarks that might be made, but it is not thought that from the purely endocrine standpoint, radiology bears a sufficiently important practical relation to these structures to warrant further continuance of our discussion.

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104 *Professional Building.*

ENDOCRINOLOGY: ITS RELATION TO NEUROLOGY AND PSYCHIATRY.*

By JOHN J. GIESEN, M. D., Radford, Va.

A branch of medicine, in which etiology is most indefinite and obscure and in which it has been necessary in the study of most of the conditions coming within its scope to blame heredity and hereditary influences as the principal causative factors, has viewed the dawn of endocrinology with a hopeful eye and, I think, has been in the main disappointed. The neurologist and the psychiatrist, whose therapy at the best is only occasionally semi-specific, very rarely specific and, most often, is purely symptomatic or experimental, has, with a few glowing exceptions, found little to add to his comfort in gland therapy. There is such a mass of literature available on endocrinology that it would take the ordinary man a life-time to digest all of it; so much of it is mere speculative nonsense and so little of it presents definitely proven facts and legitimate theory that a great deal of valuable time is being lost by the average medical man in attempting to get from the literature a comprehensive and intelligent idea of the glands of internal secretion and their relation to general medicine and the various specialties. In discussing endocrinology with many medical men, I learn that numbers of them are deriving most of their information about the subject from pamphlets and epitomes published by enterprising and business-seeking drug houses and the contents of these are principally selling-talk and add little or no constructive information to medical science. Their elaborate claims for brilliant therapeutic results with, of course, each one's own particular preparations, but with a total lack or a minimum of information as to correct diagnosis and specificity have influenced may physicians to administer gland products indiscriminately and with little or no appreciable benefit to their patients. This or that gland, then, in some physician's opinion, gets a "black-eye," so far as its efficiency is concerned in the treatment of some condition where, most probably, after all, a hypo-state of the particular gland aimed at actually did not exist. I think this class of "reading matter" has harmed endocrinology by prejudicing some good men against it before they have afforded themselves the opportunity of studying the subject properly. However, I wish to say that a few of the better drug houses have been of unquestioned aid in advancing the knowledge of the endocrines by producing extracts and other preparations of the various glands in pure form, accurately standardized, for legitimate experimentation by the profession, also by legitimate research in their own laboratories. Their aid should not be deprecated.

The neuro-psychiatrist has been no better than the man in general practice or in other specialties in nonsensical and poorly constructed gland therapy and experimentation. For instance, some fat, sluggish women at the menopause, with symptoms of depression or melancholia, have been given thyroid in harmful doses because they looked a little like myxoedema, while actually at times these women have a high vascular tension and a plus basal metabolism reading. In spite of the high blood pressure and the metabolic reading, some of them improve on pluriglandular therapy with an infinitesimal dose of thyroid gland included. Thyroid in physiologic doses, however, as is sometimes given, is distinctly harmful and detrimatal. I know of several instances where poor old maiden ladies who manifested neuroses or psycho-neuroses at the menopause and even

*Read as part of the symposium on Endocrinology, at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

some young women with hysteria have been fed orchic substance. I do not know the particular theory behind such medication and I refuse to plead guilty to such far-fetched therapy. A few neurologists, and some of them men high in the specialty, have gotten the pituitary fad in epilepsy, because it is claimed that there is a pituitary deficiency in some types of this disease. They neglect or interdict rational forms of therapy and push pituitary feeding in every case with the result that the rare case where pituitary is indicated is sometimes helped and the other ninety-nine per cent get worse. In the chronic and graver forms of psychoses, particularly dementia praecox, every sort of gland, singly and in every conceivable combination, has been given but the praecox cases continue to fail to get well and still constitute fifty per cent of our asylum population. In spite of the startling advances in endocrinology and the unquestioned but poorly understood role played by the endocrines in mental and nervous disease, we must still deal with heredity and hereditary influences as the predominating and overwhelming etiological factor.

Had I the time, I could enumerate all of the many neurological and psychiatrical conditions and elaborate on the alleged role played in each one by the endocrine system as a whole or by the secretion of the individual glands *per se*. I could further take up each gland with a known or theoretical secretion and elaborate on the many actual conditions, relating to neuro-psychiatry, which its hyper- or hypo-state or total absence of secretion could probably bring about. This, however, would necessitate a volume rather than a short review.

It is admittedly true that some definite disease entities, for instance cretinism, hyperthyroidism, acromegaly, dystrophia adiposogenitalis and others, in all of which a definite pathologic state of one or more of the glands of internal secretion is at fault, present in many cases true neurological or psychiatrical symptoms and for this reason occasionally reach the hands of the man dealing with mental and nervous diseases and the endocrines are specifically utilized by him in such cases. To this extent, then, endocrinology relates definitely to neurology and psychiatry. In all other cases the relationship is indefinite and mostly on a semi-specific or theoretical basis to the extent that in the hysterias, the various types of neurasthenia, in all functional neuroses, in epilepsy, in the manias associated with adolescence, pregnancy and the menopause, in the various phases of manic-depressive psychosis, in psychoneurosis and even in senile dementia, the endocrines are used in treatment haphazardly and indiscriminately by some, cautiously and conservatively by others, and, by some, not at all.

Dercum says, "Evidently in the graver forms in which gross or marked failure of development is present, such as in idiocy, imbecility, constitutional inferiority, and very frequently in dementia praecox, the facts set an abrupt barrier to our attempts at therapeutics. This is not entirely true, however, in the milder forms such as we meet with in the neuroses." I think Dercum has very aptly put the proposition and I shall attempt to discuss the subject from this angle.

Old age is marked by a series of anatomical and physiological changes of a degenerative nature in which we might naturally expect the endocrines to take part as well as play a role. Some of the senile alterations suggest endocrine factors such as scantiness and dryness of the hair, dryness of the skin, the manifestations of a depressed metabolism in the osseous structures, the tendency to chilliness, sluggish mentality, sexual impotence, tremors and glycosuria. Administration, therefore, of pluriglandular mixtures theoretically should halt senile decay and prevent, among other manifestations, the nervous and psychic features. In the opinion, however, of such men as Hoskins, Barker, Halsey and others, in which I humbly concur, the glands here fail to meet the issue. Possibly we have not yet reached the point where they are properly prepared or properly administered or the proper combination used. In the male, they seem to fail entirely. It is my opinion, however, that the one bright spot in endocrinology in its relation to neurology and psychiatry is in ovarian therapy for the treatment of nervous and psychic features in women at the menopause. When ovarian preparations are given hypodermically, they certainly do help these cases. By mouth, I find them usually ineffective. Many women pass through the menopause with little trouble. Many have more or less characteristic symptoms, such as hot flashes and sweats, vague pains, sensations of uneasiness, headaches, nervous apprehension, etc. A few present definite psychiatric features, principally manic-depressive, and often are accompanied by indications of an over-active thyroid. This is likely due to lack of luteal secretion, which we know in

XUM

menstrual life exerts inhibitory control over the thyroid. The woman with little or no trouble at this epoch must have an endocrine system which quickly adjusts itself to new conditions. In the others, ovarian and corpus luteum therapy does help to bring about this adjustment more quickly probably by inhibiting the thyroid and apparently acting as a regulator or tonic to the whole endocrine system, which, temporarily, seems to get out of gear.

We admit some relationship between epilepsy and the endocrines but nothing is definite. Tucker believes that a deficient pituitary secretion leads to periodic convulsive seizures. However, many definitely known hypopituitary states do not have convulsions. In a rare case, pituitary feeding does seem to help, but I have seen no case that did well unless the gland administration was supplemented by luminal or bromides. Probably we have in epilepsy a condition where more than one gland is at fault and one in which a proper combination of pluriglandular therapy would avail more. Epilepsy is almost always an hereditary disease and pituitary feeding in cases with a definite hereditary coloring will usually do no good.

In the asthenias, neurasthenias and their related ailments, we feel that the adrenal system is at fault. We do not, however, secure results from feeding adrenal substance or by giving epinephrin hypodermically. In the sexual neurasthenics and in sexual perversions, some experimental work with the endocrines has been done, but little in the way of definite results or proven facts has been obtained although we must feel here that the endocrines do play a large part. The recent Franks murder case in Chicago and the subsequent trial has brought the endocrines largely into lay prominence by the testimony of alienists that the endocrine systems of the murderers (particularly the pineals) were deficient enough to account for their so-called childhood phantasies and other psychic abnormalities. These boys did unquestionably have diseased minds, in the popular sense, for no normal human could deliberately take life as they did. It is possible that their psychic abnormalities were in a sense resultant from endocrine disturbance. However, a direct statement to that effect, in the light of our present knowledge of endocrinology, is entirely premature and gets one into dangerous territory.

In paralysis agitans, we feel that the parathyroids are deficient. Berkley claims favorable results in sixty to seventy per cent of his cases of paralysis agitans treated with parathyroid; the experience of others is entirely to the contrary. Probably where there is a toxic state behind some nervous or mental ailment, parathyroid because of its alleged detoxicating effects, might help. I have had no experience along this line. Recently it has been claimed that if parathyroid is used supplementary to chaulmoogra oil in the treatment of leprosy, almost miraculous results are obtained. If this be true, it would certainly prove that parathyroid does have a detoxicating power. In paralysis agitans, which is not so much a toxemia as it is a degeneration, we are certainly not getting results with parathyroid gland feeding or with anything else.

The gonads, outside of their value in treating menopausal conditions, which have already been discussed, are of questionable value therapeutically.

Summing up, the ovary, pituitary and thyroid bear a fairly well defined and satisfactorily understood relationship to a few certain nervous and mental diseases from the standpoint of etiology, pathology and therapeutics. The present status of other conditions in which these three glands play a part and the relationship of the other units of the endocrine chain to neuro-psychiatry is mostly indefinite, vague and unsatisfactory. No doubt endocrinology actually plays a much larger part in this branch of medicine than is now apparent and much more careful research is still needed and much less indiscriminate experimentation.

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ENDOCRINOLOGY: ITS RELATION TO THERAPEUTICS.*

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This symposium on endocrinology includes papers dealing with the relationship of the subject to every branch of medicine. The fact that such a symposium is possible (its applicability to every field of medicine) is conclusive proof of the importance of the subject. A discussion of such a far-reaching and inclusive subject should be of value to workers in all fields.

*Read as part of the symposium on Endocrinology, at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

Historical

The widespread interest in and intensive study of internal secretions are of recent date. In a period of thirty-five years the whole structure and point of view of physiology and functional pathology have been revised, and some of the most fundamental concepts of general biology have been reconstructed on the basis of internal secretions. In the healing arts of primitive peoples, as well as in the earlier periods of scientific medicine, remedies were employed and measures resorted to which are direct fore-runners of the organotherapy of today. Bordeu in 1775 was the first to formulate a general theory of internal secretions. Hahnemann's homeopathy threw out a branch, isopathy, following out very closely the more modern Hallion's law, in which a substitutive and homostimulative system of therapy was introduced, administering healthy organs of healthy animals for diseases of those same organs in man: fox lung was given for pulmonary disease, wolf's liver for hepatic troubles, ox eyes for ocular affections, etc. Berthold in 1848 was the first to demonstrate experimentally the nature of the activity of a true ductless gland. Claude Bernard in 1855 first coined the word "internal secretion" and gave expression to the doctrine of an internal secretion. The actual date, however, upon which the doctrine of internal secretions, as now known, may be said to have been born is June 1, 1889, the date of the lecture given by Brown-Sequard, describing researches upon himself, at the age of seventy-two, in which he had injected testicular extracts subcutaneously, claiming remarkable physical and mental rejuvenation. Though much ridiculed, and probably over-enthusiastic, Brown-Sequard, as founder of the doctrine of internal secretions, has opened up to physiology a new and fruitful field for experiment, has paved the way for the rightful understanding of many pathological derangements, and has pointed out a rational, and, in many cases, a remarkably successful method of treatment. By the steady work of clinicians, pathologists, experimental physiologists, and biochemists, the present day conception of internal secretions has been reached in which the internal secretions are regarded as a means of maintaining an harmonious interaction between the various cells, tissues, organs and parts of the body. A few therapeutic principles have been worked out, some knowledge of which is a prerequisite to the rational employment of organotherapy.

A clear understanding of what we are trying to accomplish will greatly facilitate the results of our therapeutic procedures. Too much of our therapy is empirical rather than rational and it should be our purpose ever to provide a more rational basis for whatever treatment is undertaken. We should plan our treatments as far as possible in accord with principles, either well established, or likely to become so. Barker states, and very truthfully, that many practitioners are using endocrine products in an utterly desultory manner in the treatment of disease before inquiring into the rationale of such treatment, accepting readily the statements of advertising pamphlets which make their way daily to our desks, the only virtue of which is to enrich their authors. Many glandular products are thus extolled and placed at the disposal of physicians for therapeutic use: some of these are of value, others of them are of doubtful value, and many of them are absolutely worthless.

The profession is evincing a lively interest in endocrinology and rightfully so. The laity is also evincing the same interest and has an exaggerated idea of our knowledge of endocrinology, and is prone to cherish hopes which we as physicians cannot as yet fulfil. It is important that the profession and the laity, in so far as possible, be kept posted as to the actual state of our knowledge in this field, so that this knowledge may be used in appropriate cases, and so that not more than is legitimate in the present state of our knowledge may be expected. Much of the glandular therapy of today, however harmless to the patient, injures the good name of the medical profession with the intelligent laymen. We cannot practice quack methods and escape the just censure of society. Unfortunately, much of our endocrine therapy is empirical, our fundamental conceptions having been attained by clinical observations of end results rather than by rational induction from basic facts determined after the approved fashion, by controlled experimentation. Empiricism has a legitimate place in medicine, it having often been said that the value of any procedure in medicine must finally be determined empirically in the crucible of the clinic. But remember, a crucible is not an open hearth into which junk may be thrown promiscuously, nor is the result of a crucible test determined by the amount of smoke and

spluttering produced. The only empiricism that is of value is that which results in well substantiated facts. Much of the confusion in the endocrine field would seem due to over-anxiety to escape the odium of empiricism, leading to forced rationalization when no genuine rationalization is possible.

Many normal functions—visceral, neural, mental, metabolic—are dependent upon the products elaborated in and distributed by the glands of internal secretion. Hyperfunction, hypofunction, or dysfunction of any of these glands may give rise to serious pathological states that sooner or later become evident in recognizable clinical syndromes. When confronted with the various syndromes for analysis and treatment, it is with great difficulty that practitioners orient themselves, owing to the variety of forms of disorders of the ductless glands which nature presents, as well as to the fragmentary character of the existing knowledge. This difficulty becomes all the greater because of the tendency for a disorder of one gland to be associated with a disorder of one or more of the other ductless glands.

Endocrine Organs and Their Functions

Extirpation experiments in healthy animals, correlated with clinical observations, have established the following facts:

Loss of the thyroid is followed by cretinism in the young and myxedema in the adult. Hypothyroidosis and athyroidosis lead to cretinism and myxedema.

Loss of the parathyroids induces depression, tetany and death, in a short time, unless the animal is subjected to special dietary and diuretic control.

Loss of pancreas leads to absolute diabetes, and death from diabetes (in the dog) in from four to seven weeks. So in man loss of secretion of the islands of Langerhans leads to diabetes mellitus.

Loss of the testes and ovaries is followed by persistent sexual infantilism in the young, and in the adult by loss of the sex urge and sex functions, and by gradual atrophy of most of the secondary sex characters. Castration and spaying in man produce the same effects, with the additional factors of nervous disorders of the menopause.

Loss of the suprarenal medulla induces no symptoms and no disease, and clinically hypofunction of the suprarenal medulla produces no symptoms as far as known.

Loss of the suprarenal cortex causes profound prostration and death within a short time, just as clinically partial or total destruction of the suprarenal cortex leads to Addison's disease and death.

Loss of the posterior lobe of the pituitary gland produces no symptoms, though some observers hold that diabetes insipidus and disturbances of metabolism result, others holding that these symptoms are due to injury to the base of the brain outside of the hypophysis.

Loss of the anterior lobe of the pituitary gland produces impairment in growth and infantilism in the young, and in the adult leads to adiposity, somnolence, and atrophy of the sex glands and failure of the sex function. So clinically, degeneration of the anterior lobe of the hypophysis leads to infantilism.

Extirpation of the pineal gland produces no symptoms. The same might be said of extirpation of the thymus except hastening of adolescence in the young.

As for hyperfunction: in man, assumed hyperfunction of the endocrine organs is the causative agent in many conditions, among which may be mentioned the following: toxic goitre (the thyroid); acromegaly (the anterior lobe of the pituitary gland); hypertension (suprarenal medulla and thyroid); precocious puberty (suprarenal cortex, hypophysis and the pineal gland); diabetes (thyroid); excessive menstruation (ovaries or the corpus luteum).

Giving this short summary of the picture of hypofunction and hyperfunction of the internal secretory organs, I realize that I have digressed somewhat from my subject. But, to treat any malady with intelligence, we must have some idea of the underlying abnormality. Knowledge of the uniglandular diseases will assist in the analysis and treatment of the polyglandular diseases which we are called upon to care for. Clinical-pathologic studies have shown that uniglandular endocrinopathies are rare, whereas pluriglandular endocrinopathies are common. This is to be expected, considering the present day conception of the linking together of the endocrine organs into a system of reciprocally dependent organs.

Source of Glandular Therapeutic Agents

There is a pressing need of standardization of methods of manufacture and of assaying of glandular products. The actual amount of active agents, be this a hormone or what not,

may vary a great deal under varying conditions. Even though a given gland contains a large amount of the hormone, there is no certainty that it will not be lost in the manufacture of the gland products. It would thus seem wise for the individual worker in this field to adopt some one preparation of each gland and to use that exclusively for considerable periods of time, using the desiccated material that has not been subjected to any process of extraction or chemical treatment or, preferably, the refined active principle where this has been isolated. Only by patient, careful and conscientious observation and recording of clinical results will organotherapy take the place that it should take in the practice of medicine.

Principles of Organotherapy

As a result of the careful observations of workers in different fields, a few therapeutic principles have been evolved:

1. Substitution in endocrine deficiency; according to which the physician substitutes (a) an organ derived from another person or from an animal by transplantation, or (b) fresh or dried glandular substance derived from animals, or (c) an active principle of the gland involved, extracted from the glands of animals, or prepared artificially by the manufacturing chemist.

2. Homostimulation, based upon Hallion's law, "The extract of an organ administered in suitable amount has an elective stimulating action on the functional activity of the same organ in the patient to whom it is administered."

3. The principle of mild stimulation in endocrine deficiency, in which the activity of a deficient endocrine organ may at times be increased by mild stimulation, either by X-rays, radium, or the administration of other glandular products which have a stimulating effect upon the gland involved. The latter may be termed the "Hormone Therapy by Reciprocal Action" as described by Borchardt, based upon the correlation of the endocrines. Therapy is not directed to the gland which plays the most important part in the clinical syndrome, but to another gland in the same chain which acts as an intermediate factor in producing the effect, or produces physiological effects which compensate for those of the affected organ.

4. The principle of using endocrine products for their purely non-specific pharmacologic properties, examples of which are the use of pituitrin in diabetes insipidus and adrenalin in bronchial asthma.

5. The principle of organ reduction or of function reduction in endocrine hyperactivity. This principle may be applied in several ways depending upon the nature of the condition and the effects sought for. The function of a hyperfunctioning organ may be reduced by partial excision, or by causing necrosis of its cells by injection of hot water, by galvanocautery, by electrolysis, or by intensive radiation with X-rays or radium. Or the function may be reduced by lessening the blood supply by ligation of its vessels or by cold applications, or by injury short of necrosis by means of X-rays or radium, electricity, or well directed pharmacotherapy.

6. The principle of multiglandular therapy in pluriglandular syndromes and in general sclerosis of the endocrine organs. Engelbach feels that we can accomplish more by uniglandular therapy skillfully directed even though we have a pluriglandular disorder. He advises making the test with one gland substance for a long time to determine whether we get a therapeutic reaction. If we do not and we feel that there is another gland involved, give the other substance singly, noting results. In this way we may arrive at just the sufficient dosage and the correct amount of each substance which the individual may need which cannot be expected in using stock prescriptions of pluriglandular substances.

Therapy of the Endocrinopathies

Though the above principles are not hard to understand, the application of these principles in practice is of necessity restricted, owing to the fragmentary character of our knowledge. It is also well to remember that the use of the endocrine products is not limited to conditions having some endocrine abnormality as their basis.

Considering the number of internal secretory glands and the fact that each of these glands may produce symptoms as result of hypofunction, dysfunction, or hyperfunction, it will readily be seen that there are possibilities of many different endocrine syndromes. However, in so far as medical therapeutics is concerned, our treatment is directed mainly toward the treatment of the hypofunctioning glands, that is on the principle of substitutive therapy. The future will undoubtedly unfold many other conditions amenable to organo-

XUM

therapy. But at present we would do better to limit our discussions to known facts rather than to mere theorizing. Of the endocrine products of known activity, thyroid preparations, preferably thyroxin, dried pituitary gland substance and pituitrin, adrenalin, and insulin are the only ones which can be depended upon in therapeutics with any degree of certainty.

Thyroid, either the dried gland substance or thyroxin, is one of the most useful agents we have in medicine. According to Sajous, it is indicated in:

1. Diseases due to slowed destruction of toxic wastes, such as tetany, disorders of the menopause, asthma, chronic rheumatism, migraine, and in those due to slow oxidation of fats, as in obesity.

2. Diseases due to lowered general nutrition of all tissues, including the bones, as shown by its action in hypothyroidea, cretinism, etc.

3. Diseases due to lowered nutrition of the muscular elements, including the skeletal and vascular muscles, as shown by its action in general adynamia, neurasthenia, and myasthenia.

4. Infectious diseases, increasing resistance by producing an increase of immune bodies.

If there is reason to believe that in any of these conditions the thyroid is underfunctioning it will undoubtedly be indicated and will yield good results. But promiscuous administration, without careful examination of our patient, simply on the "hit or miss" principle, is to be strongly condemned. Brilliant results will be obtained by thyroid preparations, provided they are potent, in cases of cretinism, myxedema, and in many cases of masked hypothyroidea. These latter cases require close study, including basal metabolic determinations. Small doses should be given, gradually increasing so that symptoms resulting from overdosage do not occur.

Pituitary gland products have a very definite place in therapeutics on the principle of both substitutive and pharmacologic therapy. Whole gland, posterior or anterior lobe preparations, are used as indicated in the individual case, the desiccated posterior lobe, "Hypophysis sicca," and the extract of posterior lobe "liquor hypophysis," being official. Desiccated anterior lobe is not official though used. Obstetrical pituitary solutions are two and a half to three times the United States Pharmacopoeia standard; surgical pituitary solutions about five to six times the Pharmacopoeia strength.

From a substitutive standpoint, we must be familiar with the physiology of the lobes of the pituitary before we can hope to make use of any of these products with any degree of intelligence. Engelbach gives the functions of the two lobes in the following words:

1. The anterior lobe regulates and controls (a) skeletal growth: and (b) the function and development of the gonads and the secondary sexual characters.

2. The posterior lobe is definitely concerned with (a) carbohydrate metabolism; (b) the contraction of involuntary and unstriped muscles—peristalsis and uterine contraction; (c) the renal secretions—polyuria; (d) the blood pressure: and (e) the body temperature. Engelbach still further states that there are undoubtedly many other functions possessed by the lobes of the pituitary gland, but our knowledge of these is so limited as to make it impossible to make use of them as evidence of disturbance of activity of the individual lobes. It is also true that this gland is not alone involved in performing the above functions, the correlated action of the entire endocrine system again coming into play. But the influence of the other glands will be appreciated by careful study of other clinical manifestations and complexes associated in which we recognize the action of related endocrine organs.

Various clinical types can be differentiated, depending upon the age at which the individual lobe deficiency began, as well as upon the state of activity of the involved lobe at the time of observation. Engelbach in grouping his case has noted that a great majority of each group of cases presented a constant cardinal sign or symptom. Apparent opposite syndromes will be brought into agreement and explained on a common basis if the cases observed are considered from the above standpoint. Many patients with amenorrhoea, dysmenorrhoea, menorrhagia, metrorrhagia, headache, obesity, abdominal pain, epilepsy, somnolence, have an underlying hypopituitarism. This may be of unilobar or bilobar type. If the cases be studied carefully, a correct diagnosis can be made and relief can be secured by instituting intelligent therapy with pituitary gland products.

Engelbach feels that there are always at least two glands involved in these cases, one being the primary cause of the disease, and the other being secondarily involved because of

withdrawal of the secretion of the primarily affected gland. In the treatment of these syndromes he advises using first, the glandular substance secondarily lacking, later substituting the gland substance primarily involved. In this way we will supply the deficiency resulting from both the primary and the secondary abnormality.

Perhaps the use of pituitary gland preparations for their pharmacologic action is the most important. The use of pituitrin in shock, uterine hemorrhage, intestinal paresis, uterine inertia during the second stage of labor after complete dilatation of the cervix, diabetes insipidus, and asthma in combination with adrenalin, is of the greatest importance.

Adrenal gland preparations are of doubtful use in substitutive therapy, though their use in Addison's disease may be productive of good. However, for its pharmacologic action, the use of adrenalin is widespread and is attended by most satisfactory results. Thus, in surgical heart failure, collapse from hemorrhage, shock, toxemias, including bacterial infections, when collapse threatens with a persistent hypotension, hypothermia, cyanosis, it is often life saving. Its use in relieving an acute asthmatic paroxysm is frequently spectacular. More recently its usefulness in preventing the occurrence of reactions following the administration of salvarsan and in counteracting the results of hypoglycemia induced by excessive doses of insulin has been emphasized.

Pancreatic preparations have been of doubtful use in the past, though, with the advent of insulin, the reverse is true. No agent we have in therapeutics is surer in its action than insulin. Recently volumes have been written regarding its use in diabetes mellitus, with which I am sure you are all familiar. It is, as you know, an extract derived from the islands of Langerhans in the pancreas, representing the internal secretion of the pancreas. It bids fair to be of untold benefit to humanity and especially to those unfortunates whom we have heretofore been unable to benefit. Its use should not be abused as is apt to be the case with any new preparation. There are very definite indications for insulin in diabetes, not all diabetics requiring its administration. My feeling is that it should be reserved for the severe diabetic, the diabetic child, diabetes complicated by acidosis, coma and gangrene, and as an adjunct when surgery is indicated or practiced. It should not be forgotten that it is not a cure for diabetes and that its use does not mean that we can neglect the diet. On the other hand, diet is even more important with insulin than without insulin for we are using a very potent agent and one fraught with danger, unless we understand its action and know what our patient is getting in his diet. The dose should, of course, be regulated to the needs. The time of administration is to be determined according to conditions. In my experience it has seemed best to give insulin about fifteen to thirty minutes before meals, and at all times by hypodermic injection, it being inactive when given by mouth. The fact that it has to be given by hypodermic injection militates against the routine use in all diabetics.

Recent reports are very favorable to the use of insulin for its pharmacologic action in the nausea and vomiting of pregnancy in which there may be marked acidosis, as well as to its use in postoperative acidosis. In both of these cases it is used in conjunction with glucose.

Summary

An historical sketch has been given of the development of organotherapy. Warning against the indiscriminate use of the products of internal secretion has been urged. The far reaching effects of the endocrine organs have been described, and the consequent multiplicity of syndromes and difficulty of correct interpretation of the syndromes have been mentioned. A short summary of the symptoms produced by loss of hypofunction and hyperfunction of the endocrine organs has been deemed in order Attention has been called to the need of standardization of the agents used in therapeutics. The principles of organotherapy have been given in brief. Lastly, the conditions in which the internal secretory products may be of value have been enumerated.

Conclusions

1. The use of endocrine products has a very important place in our therapeutic armamentarium.

2. It is believed that the future will witness signal therapeutic achievements in the field of endocrinology.

3. Avoidance of the indiscriminate use of worthless endocrine products, with careful standardization and assaying of the principles

XUM

derived from the internal secretory organs, together with careful observations and honest records of the results accomplished, will serve to develop this very useful and important field of medicine, of which our knowledge is at present, very slight and inaccurate.

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MENOPAUSE AND CLIMACTERIC.*

By JOHN N. UPSHUR, M. D., Richmond, Va.

Two periods in the life of every woman of deepest significance to her well being are puberty and the mid-life change, the latter being the time when the line is crossed from the child-bearing period—about thirty years—into that of decline, though this latter part of life may be much its longer period. It is said that when the girl starts early she stops late; that if she goes wrong in the beginning she is wrong to the end. At the outset, I would have you grasp the fact that the menopause and climacteric are two different conditions. The return of the flow may be regular and may keep up for a number of years, and yet the woman be in her climacteric; and the menopause be established, and yet the climacteric go on for years after. In the development of our knowledge of the physiologic conditions at work in the human system, we realize the complex situations which exist. Before the girl has her menstrual flow established, functioning in the endocrine glands is at work, predisposing to and modifying, and comfortable and healthy development of puberty is dependent upon the smooth working of these glands. Change in the shape of the pelvis is credited to the development of the ovarian secretion, and a definite relation to the hypophysis and other glands, of a somewhat inhibitory character as regards the anterior lobe, compared with the glands when influenced by the gonads in the male.

The inhibition is more marked when the flow is established and we see the developed corpus luteum modifying the functions by its stimulation. These influences react on the thyroid in anticipation of pregnancy, and when it fails to occur, the secretion from the lining membrane of the uterus reacts on the ovary.

Bandler says, "There is no question in my mind but that the posterior lobe of the pituitary has trophic control of menstruation, and the well being of the uterine adnexa. Dysmenorrhoea may be due to excessive action of the posterior lobe of the pituitary aided by the corpus luteum. In some women, the premenstrual symptoms are marked swelling and tenderness of the breasts, swelling of the thyroid, nervous irritability, or depression, etc. Marked instability of the gland, probably, is often responsible for the pain of dysmenorrhoea." Because of failure to recognize these influences, the girl goes to the operating table for divulsion and curettement, and instead of being helped, is often made worse.

When the time of retrogression comes, varied conditions in the flow may exist. The flow may be normal in every respect, it may be too frequent or delayed, it may be excessive, or scanty, but withal, the premenstrual symptoms are urgent, beginning possibly a week before the expected time of return, flushes, tingling in the extremities, tachycardia, a feeling of fright, especially if in a crowd, more or less acute headache, usually in the occiput, sometimes like a bolt through the temples, and in the eyes, pituitary, usually modified, but sometimes more intense when the flow comes on.

The first menstrual symptoms, usually headache and lassitude, last probably for a week, and withal an intractable digestive disturbance, especially evident by large accumulations of flatus and pain. The digestive disturbance cannot be put upon any special line of diet and often, when these cases fall into the hands of the stomach specialist, they go the whole round of lavage, test meals, X-ray, etc., and in the end get nowhere.

We may have three conditions in the thyroid, over-activity, under-activity, instability, marked in character—the first of excitable type, the second depressive, the third a mixed type, manic in character, resulting in melancholia, or other forms of instability. These last are the pitiful cases, in which the happiness of a woman and her family are wrecked. Do they get well? When the whole thing is over, sometimes, but often these cases are hopeless to the end.

Should these cases be restrained? Not if it can be avoided, but they should have intelligent treatment from administration of the gland extracts to supplement the lowered function or upset balance of the endocrines during the period of retrogression. Furthermore, de-

*Read as part of symposium on Endocrinology at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

Since reading this paper, Dr. Upshur has died, as noted in this issue of our journal.

pression in the pituitary leads to the development of obesity, and greater tolerance of sugar. but reverse conditions in the pituitary, and other depressive conditions that may be present at this critical period, may be the initiative of diabetes. Under these modifying influences, the subject may eventually succumb to pernicious anaemia.

Injury to the cervix, unrepaired or unheeded. may develop cancer, and, when flow has been irregular, or has ceased for a period and returns, there should be no delay in careful examination to ascertain if malignancy is developing, in which event the remedy should be applied before it is too late.

If there be hypopituitarism, low blood pressure and slow pulse are found, and the subject is dull and drowsy.

Alterations in these endocrine glands are responsible for the varied nervous symptoms we have to contend with in these cases. It should not be forgotten that when an artificial climacteric has been brought on by removal of the ovaries, the artificial precipitation of change of life may produce all of the nervous symptoms intensified, even to mental unbalance and melancholia, nor should we lose sight of the fact that all cases of melancholia have a suicidal tendency, and may at times be very violent, so as to require restraint.

Occipital headache, radiating behind the ears and down the neck, the spine or the sciatic region, speak for pituitary plus. There is marked relation between the thyroid and adrenals. Perfect functioning of these glands has a marked influence at puberty in the sex development of the child, and we see symptoms at puberty which closely resemble some of the symptoms we encounter at the climacteric, the contrast of puberty and retrogression. At the period of retrogression there must be a rearrangement of gland activities. The flushes, in some cases very distressing, are largely due to deficient ovarian secretions, and I have seen the administration of varium, or ovarian extract, control the situation promptly and in a most marked degree. Just here, in passing, I would say that in scanty and painful menstruation of the young girl, the cause often is found in a slight internal secretion action of the ovaries, and prompt benefit will come by administration of varium, or ovarian extract.

It should be remembered that at the climacteric the child-bearing period is over, and there must be complete physical readjustment in the woman. If only the ovary is deficient, and an increased activity in the pituitary should exist, it is a most fruitful source of nervous and psychic trouble. The ovaries and post-pituitary must possess an even balance; the distinguishing symptoms, especially flushes, are to be combated. Not uncommonly, if there is still flow, regular or irregular, at the period. associated with these flushes is agonizing headache, located in occiput, or in some cases like a bolt through the temples, or central between the eyes in the frontal region.

Actual knowledge of the history of the woman as to the establishment of menstruation, has a more important relation to disturbed conditions at the climacteric than we are apt to realize. Foundations may be laid then influencing conditions during the child-bearing period, and finding the climax, when the climacteric is on. In the modern education of girls at the present day, just when all physical conditions should be carefully regulated, they are kept under such mental strain as to react on them physically, and the return of each menstrual period is one of progressive suffering.

In this day of athletics, the period of quiet which the girl should have while menstruating is disregarded. Many times lack of care on the part of the girl is the fault of the mother. who, absorbed in the varied demands of society, fails to do her duty in supervision of her daughter's health. The girl attains maturity and is unfitted for marriage and true wife-hood and motherhood. With this result, what is the high mental culture worth?

The rate of mortality in women at the climacteric is not greater than in men at the same age. No doubt this is due to the fact of business strain, habits of life, excess in eating and drinking, and use of tobacco, which things render men at that age liable to break down in renal, hepatic or cardiac functions.

During the child-bearing period, the trend of vascular and nerve supply has been towards the pelvis; with the advent of the climacteric, there is an upset in the balance of these forces. and the balance must be restored before the woman puts on full health. The process of restoration is of necessity attended by various nervous reflexes of almost infinite variety; the mental poise is disturbed, as indicated by loss of self-control, there is irritability of temper, morbid dread of something untoward happen-

XUM

ing, and despondency, even to the degree of melancholia.

During this change the mammary glands are periodically swollen and more or less tender. Beware of interpreting this as a pathologic condition; it is only a part of the picture. The tachycardia, often a distressing symptom, is not to be controlled by digitalis, and other so-called heart tonics. They only put on the brakes, as it were, do no good and may do harm. Control is to come from general nervines, endocrine extracts, and sedatives for all reflexes from uterine irritations. These nerve disturbances come through the sympathetic and, secondarily, the general nervous system. This is not only true in the disturbed cardiac condition, but in the gastric as well, and these troubles will best respond to the treatment indicated above.

There is lowered nutrition in the pelvic organs, the uterus and ovaries undergo atrophy, and balance in the endocrine glands is disturbed because one of the family, the ovary, is lowered markedly in its internal secretive functions. The corpus luteum is abolished, and the secretion from the endometrium, following ovulation and menstruation in the unimpregnated uterus, ceases.

Lowered nutrition in these organs makes them more susceptible to the inroads of disease, especially carcinoma. Occasionally, the flow continues normally until after fifty. In this case, there is doubt if it be a menopause in the true sense, as it may be due to some constitutional disease, nervous shock, damage from improper curettage, or application of some chemical in the endometrium. It may return with restored health, but we must not mistake a bloody discharge for menstruation, unless it possesses all of the characteristics of regular return, quantity, quality, mammary symptoms, etc. Cessation may be caused by the exhaustion of lactation, parturition, injury, from falls, blows on the sarcum or pelvis, cold, fright, or ovarian disease.

The first indication of the menopause is irregularity, without discomfort, several periods passing. Or it may be indicated by too frequent return, where the sequel is apt to be impaired general health, with the consequent anaemia predisposing to an attack of some serious and possibly fatal malady.

The compensation to the woman, accustomed for many years to a periodic loss of blood, is found in increased action of the skin, increased renal action, and increased elimination of carbon by the lungs.

We have a plethoric type, a chlorotic, and a nervous type. Even in the plethoric cases there is more or less impairment of the general health, in the chlorotic there are altered blood conditions. The nervous type are abnormally impressible, easily startled by noises, panicky, and have painful local reflexes, a notable one being spasm of the rectal sphincter, which causes great pain and is easily relieved by hot vaginal douches, local applications of heat, and nervines internally. These are the cases most prone to develop a nervous break down. Epilepsy, chorea, and other nervous affections of early menstrual life may occur, but the prognosis is favorable.

Lymphatic women, for whom the regular return of the menses has been too great a tax, improve markedly in health when the flow ceases, but plethoric women are liable to local congestions, hemorrhage, and gouty development, the menses being one avenue of elimination of uric acid. It takes more the character of acidosis than true gout. Social position exercises a modifying influence on the affections incident to this period. Those surrounded by luxury and who lead idle lives are much more susceptible to nervous affections than those more impoverished, of a lower social position, or who are forced to earn a livelihood for their families and themselves, subjected to changes of temperature, greater fatigue, or who are never free from the worry and care of children or domestic worries of housekeeping.

The prognosis of diseases occurring at this time of life is in the main favorable. But sometimes the change is so critical that the ganglionic nervous system does not seem to be able to react from it and, though there is no organic disease, the woman goes on for a few years, feeble and invalided, and eventually dies from some simple intercurrent affection.

Tilt says (Change of Life, p. 973): "In going over my numerous cases to discover why some women suffer so much and others so little at this period, I came to the conclusion that it does not so much depend upon the strength enjoyed by the system, which is constitution; nor the visible predominance of one set of organs over another, which is temperament; nor does it depend on the menstrual flow ceasing early or late, nor in women being single or married, rich or poor, but on a peculiar

susceptibility of the nervous system, a condition hidden from the microscope, but evident in the manner in which it responds to the reproductive and other stimuli. Women who suffered much at the change of life, had often suffered much at puberty, and menstrual periods; while these had seldom been attended with distressing symptoms in women who suffered moderately at cessation. I therefore conclude that the diseases at the change of life, like those of puberty, are to be ascribed to the nervous system being unable to tolerate the stimulus imparted to it by the coming into power of the reproductive organs, nor the loss of the stimulus on their falling into decay; for when the nervous system is well tempered, this stimulus improves health instead of disturbing. Vital acts, however, are never found cut and squared with mathematical precision, and I have had some patients who suffered much at cessation, although their previous health had been uninterruptedly good."

These are words of wisdom and a long experience on my part tends to confirmation of the statement. Of course, if the woman enters upon the change of life with some diseased condition of the general system or generative organs, she is much more liable to greater suffering, and succumbs much more easily under the impress of some nervous or mental shock.

It must not be overlooked that the sweatings and flushings which occur in some cases act as safety valves, and interference with these will be the starting point of some more serious malady.

In the treatment of these cases, much benefit is to be expected from the administration of the gland extracts. What extract is to be selected depends upon the accuracy of diagnosis as to *which* of the endocrine glands is failing to function normally. This is often difficult, and the problem is solved by the administration of protonuclein, which contains all of them. In my hands this has been most satisfactory. At the time of the return of the period, with symptoms intensified because of the pelvic reflexes, great comfort may be given by administration of viburnum, and I have found the most eligible form to be Hayden's Viburnum Extract. Sometimes it markedly relieves the attendant headache. Our chief aim is to sustain the system in such a way as to allay nervous irritation, and to supply stimulus and nourishment which will keep the patient as nearly as possible at the normal standard of health. This is the broad indication. The more exact management must be directed to the administration of sedatives and nerve tonics, such as strychnia, zinc phosphide, sumbul, cannabis indica, henbane and iron in judicious combination, and such means as will control hemorrhage, suitable food, rest and freedom from worry of all kinds, or such surgical procedures as will retard or remove disease, threatening or developed, in the pelvic organs or other parts of the general system.

It is an axiom not to be contradicted that *drugs are not to be administered in any case when simpler and less active agents will accomplish the same end.* I cannot too emphatically protest against the *injudicious prescribing of narcotics* or alcoholics at this time of life, because of the great danger of developing dependence upon them and establishing the drug habit, from the slavery of which it becomes almost impossible afterwards, to free the victim.

The nervous and mental conditions of women at this time make them liable to the development of the drug habit. Great responsibility, therefore, rests upon the medical attendant lest, in relieving physical suffering, we substitute a condition which brings shame and disgrace upon the woman and her family. When depressed mental condition, insomnia, etc., are to be dealt with, it is better to strive to relieve them by getting the patient's mind off of self, by change of environment, and regular exercise, if her strength will admit of it, avoiding everything which tends to mental depression and worry, and to endeavor by the force of good influence to lead the mental condition to a healthy point. Combat insomnia by administration of some form of concentrated nourishment just before she retires, as hot milk, or malted milk. A warm salt bath is most soothing to the nervous system. Regular daily use of massage and electricity, faradic or galvanic as may be indicated, is helpful. Try all simple means possible before resorting to drugs. When the necessity of drugs is imperative, never lose sight of the fact, and at the proper time withdraw them.

In very plethoric cases, local or general bleeding may be of great service, soothing the nervous system and equalizing the circulation. Appropriate treatment of any local condition must not be lost sight of. The woman must be kept free from excitement of all kinds, if

possible, and relieved from the cares of domestic life.

Indian hemp, camphor, and henbane are useful in allaying generative irritability, sometimes the cause of insomnia, and nervous depression, which I have seen act as a factor producing menorrhagia. When much ovarian irritability exists, suppositories of opium, belladonna, etc., will be of service. *Ovarian irritability must be controlled.* Local pains in the epigastrium, morbid sensations in the limbs or ovaries or other parts of the body, may be relieved by stimulating liniments, belladonna or other anodyne plaster. Digestive disturbances may be treated as indicated under general rational principles at other periods of life.

If insanity be threatened, and any lesion of the pelvic organs be in evidence as a causative factor, controlling sedatives and local treatment should be promptly resorted to. Some plethoric cases apparently suffer from weakness. These may positively be strengthened by blood-letting. In some of them nature indicates the remedy by hemorrhage from some point in the system. When this does happen, it should be carefully watched and controlled, if necessary. Bowels should be kept normal and kidneys watched that no insidious trouble, as Bright's or diabetes, develop. Alkaline waters are valuable in such cases.

Women should be informed of the indications of approaching climacteric that they may aid us in directing a physiological process, rather than wrongfully interfering with it, by trying to re-establish a previously normal flow. Marriage during this unsettled period is to be discouraged, even though the woman feels the stress of more exalted sex appetite than she had ever known before. Tilt says "That experience teaches him that exalted sexual appetite at this time is a morbid impulse, dependent on some neuralgic or inflammatory condition of the uterus or ovaries." Marriage at this time, or too frequent sexual intercourse in the married, may result in obstinate uterine disease, menorrhagia, or cancer, or some women may become insane.

Hygienic regulation of all the functions and habits should be insisted upon, especially early hours. Remembering the importance of the crisis, the medical attendant must deal with all conditions, as they arise, with tact, patience and tenderness, soothing, guiding, and directing the mind from gloomy views of self or surrounding objects, wooing it back to health as time passes, till the ordeal is passed, and the woman stands again with herself well in hand, strong and able to confront the duties and responsibilities of her domestic life, to find joy and comfort, indescribable in administering to the comfort, and contributing to the happiness of those around her.

DISCUSSION OF PAPERS IN SYMPOSIUM ON ENDOCRINOLOGY.

DR. J. B. TUTTLE, *Craigsville*: The general tendency in the last year or two has been to criticise endocrinology, and some of the criticisms are probably deserved. However, various other things in medicine have deserved and gotten the same criticism and still produced great benefit. Only in the last eleven years has endocrinology come into modern consideration. Before this we knew something of the thyroid, but outside of that, nothing. Not only endocrine products, but digitalis and other useful drugs have been commercialized by the manufacturers. We should not get excited about that. Be careful not to prescribe worthless products and they will soon disappear. Of course, this and many other subjects have been carried to extremes. The course of the advance of medicine is from one extreme to another.

In the last eleven years endocrinology has given many things to medicine which, if taken away, would set us back tremendously. We would not know how to practice medicine if it were not for endocrine products of late years. The whole subject has been one of great benefit to medicine.

Instead of each individual trying to develop something further in endocrinology, we should have every phase of the subject studied by some well organized and well financed commission, who could put definite things before the profession.

In hyper-endocrine conditions we have learned to reduce hyperpituitarism by X-ray, and during the last twelve years X-ray therapy of the thyroid and thymus glands has come in.

There is much criticism of the statement that there is some pituitary epilepsy. Five to eight per cent of these cases are due to change in the pituitary gland. We have had clinical evidence and X-ray evidence before arriving at this conclusion. There are pituitary or bilateral headaches, the kind you could feel if you could push your fingers through your temples, which yield to pituitrin. And there is the use of pituitrin in obstetrics. I think that if the profession had to do away with the cure of some group of epilepsies and a small group of headaches, and the use of pituitrin in obstetrics, it would lose much. And what if we had to discard insulin from medicine! And in the suprarenal field, adrenalin has not only remarkable internal value, but we would hate to give it up even in asthma, and in its local application we can hardly treat ear, nose, and throat conditions without it. Ovarian extract has great relation to menopause troubles when the menopause is either at the proper time or artificial.

And all these things have come of endocrinology in the last eleven years. We ask that people do not prescribe things promiscuously, nor, on the other hand, try to hold back the future of endocrinology. In the next ten years many beneficial things will come out of endocrinology unless criticism causes us to lose interest. There is a great deal to be gained if we go at the problem carefully.

DR. B. R. TUCKER, *Richmond*: I have something to say in answer to Dr. Tuttle. In the first place, endocrinologists brought this period of criticism on themselves. In the second place, the point he made has little relation to endocrinology. Endocrine therapy is the replacement of gland products which have been insufficiently produced in the body. The points brought out by Dr. Tuttle are not applicable to endocrinology, but to pharmacology. No one could assert that muscle tissue in the body has the same effect as the injection of muscle tissue extract. Although striking effects may be produced by it, they are not physiological but pharmacological. I don't want to discuss these pharmocological reactions, but if, according to dealers' statements which were given you just now, six million dollars are expended each year in endocrine products, some of them worthless, and we physicians are responsible, we should take this very seriously, and we should learn that ninety-five per cent of what we give by mouth never enters the system. This is certainly food for thought.

DR. J. N. UPSHUR, *Richmond*: This field is too wide to be covered in an ordinary paper. I am very much interested in it in connection with the climacteric. Endocrinology is only part of this broad field. Symptoms of so grave a nature as those found in this condition keep us on the alert. It tests our skill to help a woman at this period. When the climacteric begins, there are early vague symptoms before you can center on the fact that it is a climacteric condition. One of the symptoms of value to me is a sensation of tingling beginning in the arm and running to the fingers. One cannot treat these cases according to a set method. Each one is individual. One must enjoin patience on these patients. Teaching them self-control is the important thing.

REPORT OF SEPTIC CASES TREATED WITH BICHLORIDE OF MERCURY INTRAVENOUSLY.*

By R. BRUCE JAMES, M. D., Danville, Va.

In reporting the following cases I am sorry not to have any laboratory reports to make on them. They were just such cases as a physician sees in a day's work and there was no opportunity or real necessity for blood counts or bacterial cultures so far as treatment was concerned, but such records have their value and sometimes carry much desirable information. The treatment and deductions are entirely empirical and I submit them for what they are worth.

CASE 1.—In August, 1919, I delivered a young woman, Mrs. M., third pregnancy, a healthy child. Immediate surroundings were as good as the average home affords. The labor was normal in every way and I had no reason to anticipate trouble, but as sometimes happens, in spite of our best care, some of these patients become infected and develop fever, which this young mother did on the third day. Each succeeding day found the fever higher and higher, with chills, rapid pulse and breathing, flushed face and all the cardinal signs of a rapid and serious puerperal sepsis, which, according to my experience, means a death certificate a little later on. I asked Dr. S. E. Hughes to see her with me. He agreed she was a desperately ill woman, but suggested nothing more than I was doing for her, which was about all that was customary in such cases, such as disinfecting the vaginal tract, cauterizing with Churchill's Tincture all tears and abrasions about the vagina and cervix. As for drugs, I knew of none of value in such cases. But, in spite of all my efforts, she was surely slipping away. One night, at this juncture, I picked up a medical magazine and read an article by Dr. M. L. Dalton, of Floyd Court House, reporting just such a case successfully treated by intravenous injections of bichloride of mercury. I decided to try this measure the next morning if the patient were not better. The next morning she was not improved, but surely slipping a little closer towards the grave. So, with fear and trembling I dissolved one-half grain of bichloride of mercury in ten c.c. of distilled water and introduced the same in a vein. On my next visit, about six hours later, I found her temperature reduced, no chills, pale face, pulse slower. By next morning she was without fever and hungry. She rapidly recovered with no return of fever or other untoward symptoms.

CASE 2.—Mrs. L. B. E., young woman, second pregnancy, delivered July 12, 1920, a healthy child, normal labor, good surroundings, no trouble anticipated. But on the third day I found her with fever, which increased day by day. She had chills, high fever, rapid pulse, muddy complexion.

She looked septic. I completed the vaginal toilet, as usual in such cases, with no improvement. On the next day, the fifth day after delivery, I gave one-half grain bichloride in vein. On the next visit she was better, but still had some fever, rapid pulse. On the second day following I gave her one-fourth grain bichloride in vein. After this she rapidly improved and was soon out of danger.

CASE 3.—Mrs. R. H., young woman, first child, excellent surroundings, delivered a healthy child, labor normal in every particular, except she had a slight tear of perineum, which I repaired with three silk worm-gut sutures. I was called out of town and left this case in

*Read at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

care of Dr. I. C. Harrison. I felt uneasy about her for she had a slight rise of temperature on the third morning, my last visit to her before leaving. About the sixth day after delivery I had a telegram from her husband, saying she was desperately ill. On my arrival at her bedside I found a well advanced case of sepsis, temperature high, chills, rapid pulse and respiration, flushed face and glassy eyes and anxious expression. I at once removed all sutures from vaginal tear, cleansed the vagina, cauterizing all raw surfaces and waited for results. She did not improve, but grew worse. I gave her one-half grain bichloride in vein. In twelve hours she was free from fever, no chills, pulse and respiration about normal. She made a good and uneventful recovery from this time.

I have seen some half-dozen other cases with other doctors in which this treatment was used with good results.

The following two cases were sepsis of different origin:

Case 1.—A lad, age 10, seen with Dr. S. E. Hughes. Patient was running a high, persistent fever, which was rapidly exhausting his vital forces. He had been infected by a wound on his leg near the ankle, a very slight wound in which the skin was scarcely broken. The infection was serious and apparently uncontrollable under the usual treatment. I advised one-fourth grain bichloride in vein, which was given by Dr. Hughes. Within six hours the patient showed marked improvement, but still had some fever. Twenty-four hours later another dose was given him, with a complete cessation of all symptoms and the boy was soon well.

Case 2.—July, 1924, I was called to see a husky young farmer, who had developed fever, followed by chills and more fever. It was the third day I was called and found him well along in a case of malarial chills and fever, as the mother thought, and so did I for a while, until investigation showed up something more interesting. On further examining and questioning, his mother suggested that he show me a sore on his leg. He stuck his foot from under the cover, saying it did not amount to anything, which proved to be true of the sore itself, which was most insignificant, more like an inflamed insect bite, but running upward from the sore, which was near the ankle, were streaks of red following the lymphatics, spreading like flames of fire over the inside of the thigh. So this infection, and not malaria, was the cause of his trouble. I decided to try the old line of treatment in such cases. I gave him a calomel purge with quinine to follow and ichthyol on the sore and inflamed leg. I did not see him until the next afternoon, twenty-four hours later. He could take no food, with chills and sweat and great prostration. I immediately gave him one-half grain bichloride in vein. I left him for about an hour and visited a neighbor. On my return I found him in great distress, aching all over, chills and vomiting and purging. Just such reaction as we sometimes see after an intravenous salvarsan. This is the only time I have seen any reaction after giving this treatment, except severe purging, which occurs in most cases. I could do nothing further for this young man, so I left him for the night. The next afternoon I found him without fever or chills, the redness had left his legs and he was hungry. In other words, he was well. I did not see him again, but was informed by his people that he went to work in the next few days.

In these cases I have reported, and in some I have not reported, the treatment acted as much as specific as does antitoxin in diphtheria. If used early in the infection, before secondary sepsis develops, it is an absolute specific. The results permit of no doubt in the mind of the physician as to the reliability of the treatment in these cases. He knows he cured his patient, which honor is, under most circumstances, secretly divided with Mother Nature, the old lady being entitled to about nine-tenths of it, though he does not proclaim it from the housetop. Now, you may ask me, did this brilliant result follow in all septic cases treated by this method? Let me answer by reporting another case, which was not so fortunate.

Mrs. J. W. C., second child, had placenta praevia, full term. By dilatation and version I succeeded in delivering a dead child, without great loss of blood. She had not been well, complained of abdominal pain and looked sallow during the latter part of her pregnancy. On the second day she developed fever, the pain over left ovary. The pain increased along with the fever, which continued to rise from day to day, with chills and sweats. I gave her one-half grain of bichloride in vein, with only temporary abatement of the symptoms and she derived no benefit from the treatment. The pain in her side extended to the abdomen

and she died on about the tenth day of septic peritonitis.

Now the points of infection in this case were within the abdomen pus tubes in all probability. It is needless to say that she had much other treatment from many doctors but the only thing which would help her she did not get was an abdominal section with removal of all infected points, for without the removal of such points of infection treatment is of little avail. It is a condition under our present knowledge which Nature only can handle and she most often fails.

In conclusion, I will say that in primary infections where we can get at and disinfect the original wound, before secondary foci of infection have set up, the bichloride in the vein will take care of the bacteria in the blood stream and cure the patient.

It will not disinfect pus sacs or secondary foci that can not be otherwise reached.

For instance, in phlebitis, when secondary, it gives no permanent relief, though in most cases it gives a temporary bentfit. I have often heard physicians deplore the fact that we have no purgative that can be administered hypodermically with effect.

Bichloride intravenously is certainly such a purgative, but I am not sure that such a remedy is an unmixed blessing; for a rebellious stomach has saved many a patient with intestinal obstructions and compelled surgical aid before it was too late. In this and many other instances Nature is wiser than the Doctor, and to circumvent her by the hypodermic or intravenous route is not always best for the patient. Probable injury to the kidney has been a theoretical objection to the use of bichloride in such doses. But we find in practice that it does not affect the kidney at all. In all cases I have watched the kidney output carefully, and in no case has there been any deleterious effect whatever on these organs.

DISCUSSION.

DR. M. L. DALTON, *Roanoke*: I have used this treatment in hundreds of cases of all kinds of infections. It is my stand-by in typhoid fever, and, in fact, all bacteremias. I use it in pneumonia, and find that the fever abates and the crisis comes earlier, occasionally three days and usually before the seventh day. I made inquiry of the other physicians in the same community that did not use this treatment and they told me that they rarely had the crisis before the ninth day. In 1915-17, we had a lot of pneumonia in Floyd County. Before the "flu" I had a record of 187 cases, with a mortality of less than five per cent. When the "flu" struck us, all remedies failed me. Yet I did as well with this remedy, and, I think, better than with anything else. When I gave it in "flu," with apparent beginning of pneumonia, it often seemed to abort it. It looks heroic to give one-half to one grain of bichloride of mercury. I had followed the writings of the originator, Dr. H. E. Jones, of Roanoke, but could not get myself to use it in this dosage. I was forced into it. I had a case of malignant typhoid fever. Temperature on fourth day after he began to complain was 105½, pulse 135, bowels tympanic and moving voluntarily, profound delirium. I saw that the usual remedies would certainly fail in this case. I gave three-quarters grain and returned the second day to find the patient no better; gave three-quarters grain more; returned the third day and patient was no worse; gave one-half grain and he began to improve and made a rapid recovery. This is only one case. I have used it in many.

A case of ileocolitis was brought to my hospital, a child eight months old, bottle fed. Baby had been sick about ten days and had been treated by two splendid physicians. Child was growing worse. The usual remedies were used; bulgaris bacillus tablets and others. It was necessary for this child to live to inherit a large estate. Besides the usual symptoms, the child had meningitis as well, and kept its little hand going in a wave-like motion over its head. The baby had the typical meningeal moan and it slept practically none the first two nights in the hospital. I was afraid it was going to die, as nothing I was doing did any good. My brother, Dr. J. B. Dalton, was with me.

As he had seen Dr. Jones use this remedy, and had used it himself, he suggested it. I would not consent at first, but soon gave in. He administered the remedy and in half an hour the child went to sleep and slept for twenty-four hours, only arousing for nourishment about every three hours. The baby made a nice recovery and left the hospital in ten days.

With septicemia and wound infection, I have had good results, the crisis coming in twelve and very often in six hours.

In gonorrheal ochitis I get good results. A young traveling man who had been in a hospital in another town for four weeks, came to our town and had a chill, temperature 104½, with much swelling and pain of testes. I gave half-grain bichloride of mercury and had rapid abatement of symptoms. The patient left the hospital in one week. Saw him eight months later and he had no return.

In post-operative pneumonia it acts well. Given early, I have not had the temperature to go longer than twenty-four hours in what looked to be a serious case of pneumonia after a laparotomy, with rapid rise of temperature, congested lung, cough and difficult breathing.

THE INCIDENCE OF DISEASES OF THE LOWER AIR PASSAGES SECONDARY TO INFECTIONS IN THE UPPER RESPIRATORY TRACT.*

By T. DEWEY DAVIS, M. D., Richmond, Va.
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Acute pyogenic infections of the mucous membranes of the larynx, trachea and bronchi are frequently associated with, or secondary to, infection in the nose, throat or accessory nasal sinuses. This relationship is recognized most

*Read before the fifty-fifth annual meeting of the Medical Society of Virginia, at Staunton, October 14-17, 1924.

commonly in the ordinary acute cold which begins with a rhinitis or pharyngitis and then passes into a tracheitis and bronchitis, to run, as a rule, its self-limited course.

In chronic pyogenic infections of the lower respiratory tract, however, such as chronic bronchitis, bronchiectasis, bronchial asthma, abscess of the lung, etc., the relationship to a primary focus of infection in the mouth, throat, nose or sinuses is often not considered and, therefore, not recognized. Recent experience having convinced me that this association between primary infection in the upper respiratory tract and secondary involvement in the trachea and bronchi was very frequent and of considerable practical significance, I have reviewed our case histories for the past six years. During this period a diagnostic study was made on three hundred and twenty-two patients who were found to be suffering from chronic pyogenic infections in some portions of the respiratory tract. For the purpose of this review, I have excluded patients with tuberculosis, syphilis and malignant disease, and also instances of chronic cardiac failure, pneumoconiosis and bronchial irritation or sensitization to dust, food proteins and poisonous gases. In the study of these patients, advantage has been taken of most skilful and painstaking examinations by competent nose and throat colleagues, supplemented in the majority of cases by X-ray films of the lungs and accessory nasal sinuses.

In our series there were 84 cases diagnosed as chronic bronchitis. Twenty-three of these patients were not seen by a rhinologist. Of the remaining 61 patients, 58 were found to be suffering from a chronic focus of infection in the upper respiratory tract. In other words, 95 per cent of our patients with chronic pyogenic infection of the bronchial mucous membrane were shown to have definite infection in the nose, throat or sinuses.

The figures in regard to bronchial asthma are almost as striking. This diagnosis was made in 85 patients in our series. Twenty-three of these sufferers did not have a special examination of the nose, throat or sinuses. Of the 62 patients who did have this study, 57, or 90.3 per cent showed evidence of infection in the upper respiratory tract. Most of the patients in this series were adults whose symptoms did not date back to childhood and in whom the asthma was more likely to be due to infection than to food sensitization or animal emanations. Many of these patients, as a matter of fact, were given protein skin tests with negative results.

A very interesting observation has been the frequent complaint of cough in patients with chronic infections in the nose, throat or sinuses, in whom no gross demonstrable lesions or physical signs could be determined in the bronchi or lungs. Coakley[1] has recently stated that cough is a frequent symptom of paranasal sinus infection in children and, to a less extent in adults. In our series there were 147 patients with uncomplicated upper respiratory tract infection. Surprisingly enough, 72 of these patients, or 49 per cent, complained of chronic cough. Many of these patients feared pulmonary tuberculosis and with good reason since to the lay mind a continued cough implies this disease. Occasionally the chest examination in these patients revealed a few persistent crackling and fine moist rales over both apices with no change in the breath sounds or voice transmission. The sputum, if any could be obtained, was negative for acid-fast organisms and the X-ray plates of the lungs showed no suggestion of parenchymatous lesions. Subsequent observation of the course and progress of these cases has seemed to indicate that they were instances of so-called "apical catarrh," as described by Dunham and Skavlem,[2] secondary to the infection in the nose, throat or sinuses.

Reference to the current medical literature discloses quite a few articles dealing with the subject under review. In many instances, however, the statements made are in the nature of suggestions and carry little supportive evidence. Dennis,[3] however, has reported a series of 24 cases of bronchiectasis and 28 cases of bronchial asthma. Of these 52 patients, 47 had definite accessory nasal sinus infection. Incidentally, he states that a diagnosis of antrum infection cannot always be made by clinical and X-ray examination, and that any suspicious case justifies an exploratory operation. Dunham and Skavlem[2] found sinus infections in all of 25 cases of bronchiectasis; and in 42 patients with "apical catarrh," 39 were found to have disease of the nose, throat or sinuses. Hett,[4] from his experience in the nose and throat field, reported that he would like to make the dogmatic statement that all cases of chronic bronchitis are dependent on infection in the upper air passages but that his experience was hardly varied enough to ab-

solutely justify such a broad assertion. Perkins[5] states that no predisposing factor in chronic bronchitis is as important as upper respiratory tract infection. Von Zelinski,[6] Webb and Gilbert[7] and Tribble[8] are among others who insist that careful examination of the nose, throat and paranasal sinuses should be a routine in patients suffering from bronchial tract infections. In contrast to these views it is evident that many clinicians do not appreciate or recognize the relationship between infection in the upper and lower portions of the respiratory tract, and in the very exhaustive monograph by Hoover[9] on the diseases of the lungs and bronchi in the recently published Oxford Medicine, no mention is made of this association.

It is quite possible, as some authors insist, that infection about the gums and teeth may also play an important role in the production of secondary lesions in the bronchi and lungs. In a recent study of 37 cases of pulmonary infections characterized by abscess formation or gangrene, Pilot and Davis,[10] isolated the fusiform bacillus with spirochetes characteristic of Vincent's disease. These organisms are found very commonly in ulcerative stomatitis (so-called trench mouth), and are often present in enormous numbers about the teeth and tonsils.

In view of our experience and the expressed opinion of other workers, both in the field of internal medicine and nose and throat surgery, every patient who complains of cough, or presents symptoms or physical signs of a non-tuberculous infection in the lower respiratory tract, should be examined by a competent nose and throat specialist. Our experience has further demonstrated that thorough treatment of all lesions in the nose, throat and sinuses is very essential for the relief of chronic pyogenic infections in the lower respiratory tract. It happens, at times, that treatment of these local infected areas is unsatisfactory, or that it is undertaken at a late period in the chronic illness when the secondary infections in the bronchi and lungs have become so fixed as to be almost irremediable. Not infrequently very persistent and radical surgical procedures are indicated and no real success may be expected from half-way measures. In addition, many of our patients have been very much benefited by the intelligent employment of autogenous vaccines prepared from cultures of the sputum alone, or in other cases from combined cultures made from the sputum and the nose or throat secretion. Symptomatic treatment should not be omitted, but it should be emphasized that patients with chronic pyogenic infections in the bronchi and lungs do not get well until all foci of infection are radically treated and removed from the mouth, nose, throat and accessory nasal sinuses.

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608 *Professional Building.*

DISCUSSION.

DR. DOUGLAS VANDERHOOF, *Richmond*: Dr. Dav's has brought out several points of great interest. In the first place he has shown that most instances of chronic non-tuberculous infections in the lungs, trachea, etc., are secondary to pyogenic infections in the nose, throat and paranasal sinuses. His statistics in regard to chronic bronchitis and bronchial asthma are striking and very instructive.

A second interesting point emphasized by Dr. Davis is that nearly fifty per cent of patients with chronic infections in the nose, throat or sinuses, present cough as a symptom. This is illustrated not infrequently by the patient with a chronic antrum infection. When the antrum fills up he may have a frequent unproductive cough, sometimes resembling whooping cough, which disappears promptly when the antrum is punctured and irrigated. When a patient consults us for a cough, we do not think first of tuberculosis but rather of a chronic infection in the nasal sinuses.

It is important to realize that proper treatment of sinus infections is difficult and prolonged, and the patient should be given to understand that it is not a question of one or two operations to drain the sinuses but of treatment by a competent rhinologist over a period of several months to a year.

One other point of interest is the work that Dr. Davis is doing with autogenous vaccines. He secures cultures from the nose, throat, sputum and any infected area. Multiple vaccines are then prepared

from every source and intradermal tests are made with each separate vaccine. A positive skin test to any special organism suggests sensitization, the other vaccines are discarded and the patient is treated with that special vaccine to which he reacts. Recent results secured by Dr. Davis along this line have been very encouraging.

DR. FRED. E. HAMLIN, *Philadelphia*: Dr. Davis's paper is very interesting to me as it is closely associated with the special line of work I have been doing at the University of Pennsylvania in otolaryngology and bronchoscopy.

One point which Dr. Davis forgot to mention was a possibility of a foreign body in the bronchi giving rise to symptoms similar to bronchitis caused by upper respiratory infection.

One case which I recall was that of a safety pin which had been in the bronchus for several years before being diagnosed, during which time the patient was treated for tuberculosis. An X-ray examination was made of the chest and a safety pin was found located in the bronchus. The pin was so corroded it was necessary for Dr. Jackson to remove the pin in three parts.

In other cases of foreign bodies of organic nature, such as seeds and kernels, a violet laryngotracheobronchitis is started at once with toxemia and fever. These organic foreign bodies frequently act as a valve in the bronchus and will give physical signs of obstruction with emphysema, bronchiectasis and atelectasis, depending upon the degree of obstruction.

DR. T. D. DAVIS, *Richmond*, closing discussion: Dr. Hamlin brought up some very interesting questions. Unfortunately we have yet to see one of these cases. I would like to say, however, that all of our cases get an X-ray examination of the chest even if they do not show any gross lesions, but diffuse infections which are not typical of tuberculosis. We get plates to be certain that we are not dealing with anything unexpected.

MYOCARDIAL DISEASE AND SURGICAL CONDITIONS OF THE ABDOMEN.*

By J. MORRISON HUTCHESON, M. D., Richmond, Va.

It is well known that disease of the myocardium often pursues a course so insidious as to render its recognition extremely difficult. This is particularly true of arteriosclerotic lesions that involve the coronary vessels and produce latent changes which, under the stress of excessive physical exertion or surgical operation, may result in acute cardiac failure.

It is also well understood that so-called angina pectoris, one of the common symptoms of coronary disease, not infrequently manifests itself by pain in the upper abdomen. Notwithstanding the emphasis that has been placed on these facts there occur cases of myocardial disease in which the pain is so atypical and the cardiac signs so inconspicuous as to mislead the unwary into a diagnosis of disease below the diaphragm. The danger of operation in these cases need not be emphasized. When the coronaries are diseased sudden death from thrombosis is always a possibility and the strain of operation greatly increases its likelihood.

Levine and Tranter have reported, from the Peter Bent Brigham Hospital, two cases in which myocardial disease produced symptoms and signs indicative of acute conditions in the abdomen calling for operation. One patient died on the table during exploration. In the other case operation was deferred on account of the presence of sugar in the urine and death occurred forty-eight hours later. Both showed at autopsy extensive degenerative changes in the myocardium with thrombosis in the anterior coronary artery. No pathology was found within the abdomen.

I wish to present three cases in which grave myocardial disease was mistaken for abdominal conditions requiring surgery. In the first case, inflammation of the appendix complicated the picture, and a cardiac death occurred following operation. In the second, operation was postponed by the surgeon and subsequent observation revealed the true nature of the malady. The third patient survived—a laparotomy with drainage of the gall-bladder but apparently his symptoms were caused by coronary disease of which he later died.

Case 1: A white farmer, 49 years of age, was admitted to the surgical service of the Johnston-Willis Hospital November 13, 1919. He complained of attacks of cramp colic which had occurred at irregular intervals since July, 1918, and which seemed to be increasing in frequency and severity. Pain would begin suddenly in the lower abdomen and would soon be followed by nausea and later vomiting, which afforded relative relief. In several of the attacks the pain appeared to radiate upward and settle under the lower sternum. Following the attack, which usually required morphine for relief, the lower half of the abdomen remained sore for several days. There had been slight indigestion manifested by heaviness and soreness in the pit of the stomach but no constipation, jaundice or dysentery. No shortness of breath, palpitation or swelling of feet had been noticed, and no pain in the chest except that radiating under the lower sternum during the abdominal attacks. He had led a very active life, doing hard physical labor and had never been incapacitated except by the spells for which he sought treatment.

*Read at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

Examination showed a tall, spare man within a few pounds of his maximum weight. There was no gross evidence of infection in the upper air passages and routine examination of reflexes was negative. The heart appeared slightly enlarged, the apex being palpated in the fifth interspace and reaching just beyond the nipple line. The sounds were of good quality with moderate accentuation of the aortic second and no murmurs. Rhythm regular, rate 84 per minute; blood pressure 184—112. Lungs entirely clear; liver dulness from sixth rib to costal margin. The abdomen was not distended and no masses were felt. The cecum was somewhat distended and quite sensitive, pressure producing pain which radiated toward the ensiform. There was also slight epigastric tenderness, and an impulse over the right inguinal canal on coughing. The urine contained a trace of albumen and a few pus cells and casts. Phthalein 60 per cent in two hours. Blood, including Wassermann, negative. X-ray of the gastro-intestinal and urinary tracts and gall-bladder revealed a spasm at the pyloric end of the stomach which was interpreted as suggestive evidence of gall-bladder disease. The appendix was not visualized.

In view of the evident pathology in the appendix and possibly also in the gall-bladder, operation was decided on and done November 19th through a right rectus incision. On account of the hypertension, the risk was not regarded as particularly good but in the absence of obvious signs of cardiac weakness and with good kidney function, surgical intervention on definite indication was held permissible. The operation lasted thirty minutes and consisted of exploration of the gall-bladder and pyloric end of stomach, with removal of a large inflamed appendix recorded as subacute. The pulse did not go above 88 and the patient was returned to his room in good condition.

During the following night there was considerable retrosternal pain of dull character and the pulse rose to 120 per minute with a temperature of 100. The pain was said to be similar to that described as having occasionally followed the abdominal attacks, apparently induced by them. It was more or less continuous and showed a tendency to involve the heart area but did not radiate to the shoulder or arm. A diagnosis of angina pectoris was made and relief by nitrites attempted, but the pain increased in degree, requiring morphine in considerable quantity for its control. On December 1st, eleven days after operation, the pain suddenly became more severe than usual, cyanosis and collapse rapidly developed, with death in a few minutes. Autopsy was not permitted.

Death in this case was probably due to coronary thrombosis, though in the absence of postmortem studies the exact pathology can only be surmised. It seems clear, however, that some latent cardiac defect, not sufficient to interfere with previous function but too extensive to permit the increased work incident to operative strain, was responsible. Little or no evidence of myocardial disease was detected before operation, but in the light of subsequent events it seems possible that a more painstaking analysis of the history might have led to a different interpretation, and that an electrocardiogram, had this been available, might have suggested disease involving the coronaries.

Case 2: A man, aged 56, entered the Johnston-Willis Hospital, January 28, 1921, for gall-bladder operation, having been examined in another clinic and a diagnosis of gall-bladder disease made there. He complained of attacks of epigastric pain which had occurred at irregular intervals for several years. At first they came only once or twice a year but had gradually increased in frequency up to one every day or so. The pain began in the pit of the stomach, was severe in character, often requiring morphine for relief, and was frequently accompanied by nausea and vomiting. With the later attacks there had been an intense constriction around the lower chest with some difficulty in breathing, profuse perspiration and a feeling as if he were going to die. Between attacks there had been moderate shortness of breath on exertion, occasional palpitation and frequent spells of flatulence and belching. Examination showed a very slight cardiac enlargement with no evidence of decompensation. The peripheral vessels seemed somewhat thickened but smooth and straight; blood pressure 120-82. There was distinct tenderness just below the right costal margin. Blood negative. Urine contained a trace of albumen and an occasional hyaline cast. Gastro-intestinal X-ray made previously had revealed indirect evidence of gall-bladder disease. Electrocardiogram showed right ventricular pre-

XUM

ponderance with inversion of the T-wave in leads II and III.

From these findings it seemed likely that degenerative changes in the myocardium were present and might explain the attacks. Operation was accordingly deferred. On the second night after admission to the hospital an attack of pain occurred in which the accompanying thoracic constriction, difficult breathing and sweating pointed strongly to angina and, when prompt relief followed the administration of nitroglycerin, the diagnosis appeared to be established. Whether gall-bladder disease existed or not has never been determined. The patient is still living and with greatly restricted exercise and the occasional use of the nitrites he is reasonably comfortable.

Case 3: A retired business man, aged 64, was seen September 10, 1923, with obvious cardiac decompensation. Several years previously he had suffered from attacks of epigastric and substernal pain for which he consulted a surgeon and had his gall-bladder drained, no stones being found. The attacks of pain continued, however, and in June, 1923, he had a very severe one lasting about 24 hours and requiring several hypodermics of morphine for relief. Following this attack he became extremely short of breath, and often had to sit up all night in order to breathe. Examination showed obvious decompensation with passive congestion of lungs and liver. The heart was greatly enlarged but no murmurs were present. Peripheral vessels thick, rough and tortuous; blood pressure 116-89. Electrocardiogram showed right bundle branch block. On rest and thorough digitalization the compensation improved and the patient was able to get around in comparative comfort. Electrocardiogram made two months later showed the block still persisting and sudden death occurred shortly afterwards.

This case was undoubtedly one of arteriosclerosis involving the coronaries and manifesting itself first by atypical attacks of angina which were mistaken for gall-bladder disease. Operation, of course, failed to give relief, but fortunately failed to cause death, which resulted later from coronary occlusion and general myocardial failure.

Myocardial disease capable of producing sudden heart failure may be the result of a variety of causes and manifests itself by a diversity of symptoms and signs. As a rule, however, the type most likely to afford difficulty in recognition is the degenerative process known as arteriosclerosis with early involvement of the coronary vessels. It is, therefore, in middle or late life that particular care is required in cardiac investigation lest the early signs of coronary disease be overlooked or misinterpreted.

In elderly individuals especially, any pain difficult to classify should bring the possibilities of coronary sclerosis into careful consideration. The pain of coronary disease is prone to be abdominal and is quite often accompanied by gastric distention, relieved by belching. It is often induced by chilling, overloading the stomach, or by unusual physical exertion, and may be the sequel of strain produced by some other disease as in the first case reported here. Pain may be mild or severe, but its degree should not be taken as an index of the extent of cardiac pathology. Where doubt exists as to the nature of an obscure pain, its coronary origin may at times be established by a prompt response to the nitrites.

When pain is present as a symptom of coronary disease, it is usually accompanied by one or more circumstances that furnish additional evidence of its nature, viz.: feeling of constriction in the chest, a sudden arrest of motion, a sense of impending death, pallor or sweating. At times pain is insignificant or absent and brief attacks of constriction, with or without the other signs, may be the sole manifestations observed.

Physical signs are of considerably less value in recognizing coronary disease than symptoms, as no single finding is in itself more than evidence of sclerosis that might involve the coronaries. A considerable number of cases are now on record in which sclerosis was confined exclusively to the coronary vessels with no other cardiac changes that could have produced physical findings. One should never make the mistake, therefore, of finally excluding myocardial disease on account of negative findings. I have recently seen a man of 56 who suffered a rather sudden cardiac failure following a prolonged attack of pain and loss of sleep occasioned by shingles. Prior to his collapse no evidence of myocardial disease was demonstrable by physical examination.

In the detection of obscure myocardial changes the electrocardiograph is undoubtedly of the greatest value. When the conduction

pathways are involved, as is often the case, the record is characteristic and furnishes positive evidence of disease that can be secured in no other way. The electrocardiograph is not to take the place of other methods of examination, but when judiciously employed it is an extremely reliable adjunct to our means for studying the class of cases under discussion.

In conclusion, I would emphasize especially the following points:

1. Grave myocardial disease may be latent, causing few or no symptoms or physical signs.
2. Early manifestations may be atypical angina or gastric distress, suggesting abdominal disease requiring surgical relief.
3. In middle-aged and elderly individuals especially, myocardial disease is always a possibility. The greatest care is necessary, therefore, in interpreting their symptoms and in determining their fitness for operation.

Professional Building.

DISCUSSION.

DR. KENNETH BRADFORD, *Staunton*: Dr. Hutcheson's paper is one of tremendous practical interest to every one of us who does general practice. When I was in medical school, and that has not been so very long ago in spite of appearance, I was taught that angina pectoris was always manifested by pain in the chest and extending down the left arm. That was so impressed upon us that if the pain had been in the right arm, even, we would have diagnosed it as other than angina pectoris. It is very important for general practitioners to realize that this pain can occur elsewhere than in the chest and left arm and the patient may present every symptom of an acute upper abdominal lesion. This is especially important when we realize that the treatment of the two conditions is diametrically opposite. Patients with organic myocardial disease should not be subjected to operation unless this is absolutely necessary to save life. The treatment is entirely different for gall-bladder disease. Sometimes we find ourselves in a very embarrassing position in confusing myocardial disease with anginoid attacks, with other diseases which are entirely different.

DR. J. N. UPSHUR, *Richmond*: I was not fortunate enough to hear all of Dr. Hutcheson's paper, but the question of myocarditis is always of great interest to me. I just want to emphasize one or two points in connection with the diagnosis. I think possibly it is the one lesion of the heart in which we overlook the diagnosis oftener than in any other. When myocarditis has come to the point where the muscles are so much softened that the heart is dilated and enlarged and death may occur at any time, when it is too late to do anything, the condition is easily recognizable. In my opinion, one feature in the diagnosis is always significant. When you apply your stethoscope or ear to the chest, especially if the subject is past middle age, and you hear in the heart valves sounds which are perfectly normal except that they sound far away or not as entirely clear as you might expect to find them, it is very significant as a diagnostic point.

I am probably alone in the opinion I am about to give, but, after a long life of experience, I object to giving patients with myocarditis digitalis, especially in the full doses used in these days. In cases of softened heart muscles, if you give digitalis in full doses, you may get spasm and a ruptured heart. I am not particularly friendly to digitalis. You never know just what it will do. When you get diminished frequency and increased tension, you do not know when you will have diminished tension and increased frequency.

I want to emphasize these two points.

DR. L. M. ALLEN, *Winchester*: In a condition where the diagnosis is so difficult I wish to emphasize the great importance of a careful examination before resorting to operation.

One case to illustrate the point: A man seventy years of age, a retired business man, had had pain in the upper abdomen for some time. He thought he had indigestion. A surgeon was sent for, and, without making a careful examination, he gave him a hypodermic and told him that he must be operated for gall-bladder disease. The patient did not take this advice, and less than a week after this I found him a typical case of angina pectoris with all symptoms. It was too late to do anything for him. He died less than twenty-four hours.

Dr. Hutcheson's remarks should be a warning to those over-enthusiastic surgeons who wish to operate on all cases of pain in the upper abdomen. We see and hear often from our patients that which illustrates this over-enthusiasm on the part of some surgeons. I repeat that it is most important to examine carefully before suggesting any surgical procedure.

DR. C. O. DEARMONT, *White Post*: Mr. Chairman, I want to ask Dr. Hutcheson's opinion on one case. A man, age 50, in good health until operation for appendicitis, was quite nervous following the operation. He developed what he took to be indigestion, and was treated for a while, but did not improve. We were suspicious of angina because of pains distributed in chest. One night I was called to see him in a typical attack of angina. He suffered violently from 12 o'clock to 3 A. M. During that time I gave him five hypodermics of morphine, ¼ grain each, and 1/100 of nitroglycerin. What would Dr. Hutcheson have done? I had to relieve that man. I did not know anything else to do. Was I justified in this? What would Dr. Hutcheson have done under similar conditions?

DR. K. D. GRAVES, *Roanoke*: I want to cite a case which I had this summer and ask Dr. Hutcheson's advice. This man was elderly, about fifty-six or sixty. He had recently passed an examination for a large sum of insurance, which showed that he had had a thorough physical examination. He was apparently in good health, and was working on his farm. One afternoon, when walking through his yard, carrying considerable weight, about sixty pounds, he kicked at a dog, and immediately fell to the ground screaming with pain. The usual medications were given, and he was apparently relieved. About nine the next morning he screamed again, and when the family went into the room they found him dead. On autopsy it was found that the heart had ruptured. There had been two stages in the rupture: the first had torn partly through the wall, and the second, apparently the attack of the morning, had torn entirely through. There was a clot in the pericardium.

The question came up about whether this was due entirely to the strain, or complicated by myocardial disease. The microscope found no evidence of myocardial disease. The cause of death was given by attending physicians as angina pectoris. I have been thinking a great deal of this question; whether there must have been myocardial disease,

XUM

or whether the sudden strain was sufficient to cause rupture of the heart.

DR. J. C. FLIPPIN, *University*: This discussion, and particularly the remarks by Dr. Bradford, brings rather forcefully to mind the indefinite manner in which the term angina pectoris is used. It is, no doubt, perfectly true that Dr. Bradford was taught as a medical student that angina pectoris is a condition characterized by violent pain in the chest, often, also, involving the left arm. Many modern cardiologists, particularly MacKenzie, recognize all grades of heart pain with varying etiology and significance. Heart pain, like stomach pain, may be very variable in its significance. As Dr. Hutcheson has pointed out, there is very great difficulty oftentimes in accurately distinguishing between heart pains and those arising in the abdomen, even with the aid of the modern refinements of diagnosis.

DR. J. M. HUTCHESON, *Richmond*, closing discussion: Dr. Dearmont describes what was probably a case of coronary disease with attacks of angina terminating in coronary thrombosis. The final situation is a grave and critical one and I am sure that he was justified in using large doses of morphine. All one can do under the circumstances is to keep the patient as quiet and comfortable as possible and hope that enough circulation is left to keep the heart going. The pain itself is probably a factor that would facilitate heart failure.

Dr. Graves' case is interesting. I can hardly conceive of a healthy heart muscle rupturing even under severe strain. There must have been some disease beforehand. Autopsies show that coronary infarcts occur even in patients with no symptoms.

We must realize that degenerative changes in the heart and vessels of an insidious character are common in the late years of life and may occur at a surprisingly early age. The symptoms are at times obscure and misleading. I recall the case of a man of thirty-nine, previously healthy, who was suddenly seized with "acute indigestion" and died in a few hours. Autopsy showed advanced coronary sclerosis with occlusion of a large branch.

TREATMENT OF HYPOSPADIAS—ANALYSIS OF TWENTY-EIGHT CASES.*

By CHARLES Y. BIDGOOD, M. D., Richmond, Va.

It has been within comparatively recent years that success has attended attempts to repair hypospadias frequently enough to justify operation, except in the glandular types, and, although many ingenious operations had been published, each with enthusiastic adherents, the concensus of opinion—as late as 1890—was that the deformity was irremediable in the vast majority of cases.

The origin of the modern conception as regards cure of hypospadias dates back to the work of Duplay, begun in 1870 and ended in 1880, and of Tiersch, in 1869. Previous to this, the results had been uniformly discouraging, although a few suggestions had been offered which are still recognized as good, such as the recommendation of Buisson in 1861 that the band causing the chordee should be divided transversely and closed longitudinally. But even in this, he was not thorough enough, and it was Duplay who advised section of the intracavernous septum.

In 1869, Tiersch produced his flap operation for epispadias, and Anger, 1874, first used this principle in hypospadias, Tiersch also advised perineal drainage of all cases, and was opposed by Duplay who favored the insertion of a catheter through the newly made urethra into the bladder. The point of contention may well be taken as an illustration of the fact that as recently as 1890 the fundamental principles were still mooted questions, and it is probable that the constant failures encountered were due more to failure to appreciate such principles, than to a dearth of ingenious operations. This is borne out by the fact that at the present time, using practically the same operations that were used then, much better results are being obtained.

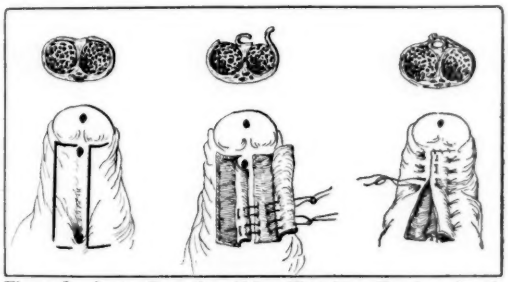

Figure I.—Anger Operation (After Tiersch). Showing also the arrangement of the flaps in sagittal section.

The Anger operation (after Tiersch) is shown in Figure I.

The reason for constructing flaps in such fashion was that the lines of suture were not in juxta position. This was first advocated by

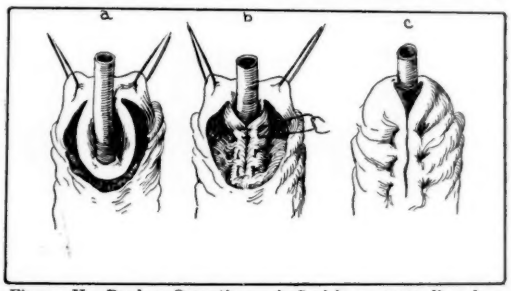

Figure II.—Duplay Operation. A Incision surrounding hypospadias opening and extending up on the glans. Tube in urethra. B. Construction of new urethra showing inversion of edges. C. Completion of operation.

*From the Brady Urological Institute, Johns Hopkins Hospital, Baltimore, Md.

Read before the fifty-fifth annual meeting of the Medical Society of Virginia, at Staunton, October 14-17, 1924.

Tiersch for the repair of epispadias. However, there is no account of his having used it for hypospadias.

The Duplay operation* is depicted in Figure II.

Of late, instead of placing the tube in the newly made urethra for drainage, a perineal drainage tube has been used. This operation is similar in principle to Anger's operation, since, in both operations, longitudinal flaps are raised on each side of the genital canal and are used to construct the new urethra.

The second type of operation recommended at this time is that of Bidder** (Figure III) which is illustrated below:

This operation consists of: 1. Perineal urethrotomy and excision of hypospadias opening; 2. Tunneling of skin from glans to perineal opening by means of a trocar; 3. Tiersch graft around a tube inserted in subcutaneous passage and sutured.

The author of this method lays great stress on (a) The graft should be 4 cm. wide; (b) The tube should be 20-21 F.; (c) A 19 F. sound should be passed on the tenth day.

Rochet* recommends that the tube used in the Nove Josserand operation be made from a scrotal flap.

The fourth type is that of Beck** (Figure V).

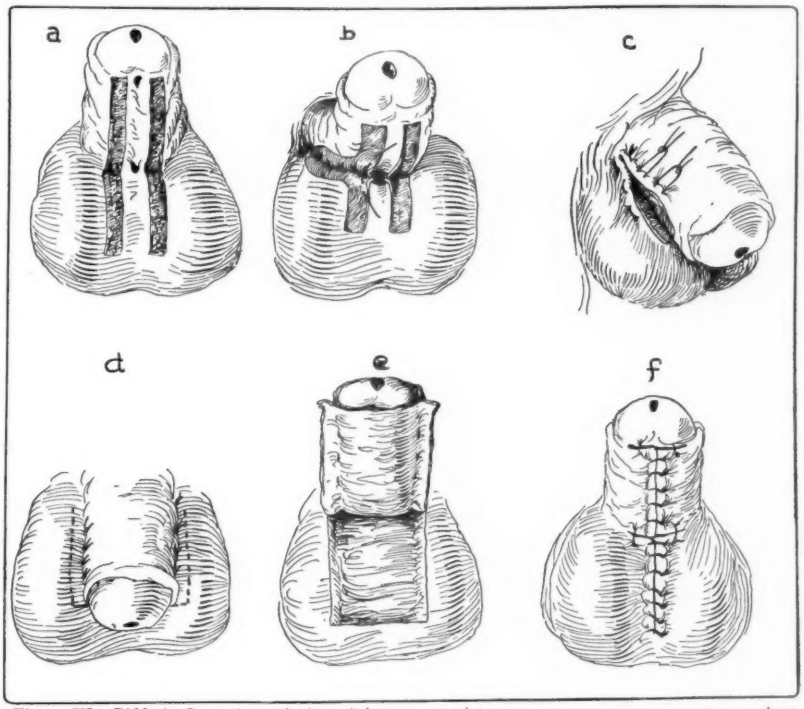

Figure III.—Bidder's Operation. A. Denuded areas on either side of genital canal and extending down over scrotum. B. Suture of penis to scrotum with inversion of edges. C. Completion of suture. D. Second operation; dotted line shows incision for freeing penis. E. Penis mobilized. F. Closure of skin.

This operation is similar in principle to the procedure advocated by Bucknall (Lancet, 1907), and enthusiastically championed by Churchman.†

The third type of operation shown in Figure IV, was developed about this time by Nove Josserand.‡

The success of this is dependent, in the glandular type, on the distensibility of the urethra. The disadvantage of this procedure is that it is liable to be followed by chordee.

It is evident, therefore, that the operations which are used at the present time had their birth in the last part of the 19th century, and that the increasing success in curing hypos-

*Archives Generales de Medicin, 1880.
**Deutsche Medische Wochenschrift, 1892. Vol. 2.
†Annals Surgery, 71, 1920.
‡Revue de Chirurgie, 4, 1898.

*Centralblatt f. Chir. 1900, No. 34.
**New York Journal, 1898, LXVII.

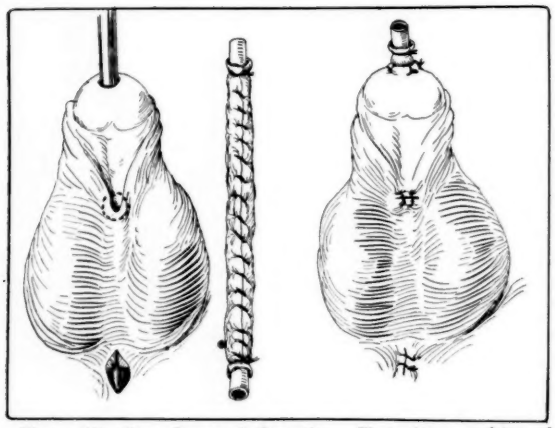

Figure IV.—Nove Josserand Operation. First stage: excision of hypospadias opening with perineal urethrotomy and tunnelling by means of a trocar from the glans to the perineal urethrotomy wound. Second figure shows Tiersch graft wound around a catheter. Third figure shows the hypospadias opening closed and the perineal opening closed, the Tiersch graft inserted into the new canal and sutured to the glans. The catheter running into the bladder for drainage.

padias in the last twenty years has not been due to improvement in the type of operations used, but is occasioned by a more lucid comprehension of the fundamental principles underlying all plastic surgery. These basic rules

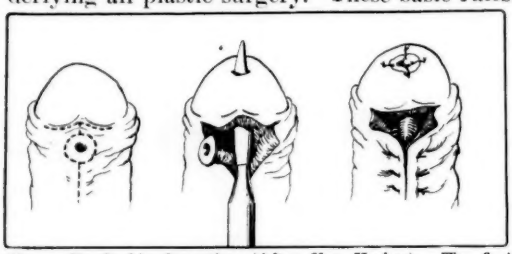

Figure V.—Beck's Operation (After Von Hacker). The first figure shows the line of incision. The second figure shows freeing of the urethra and formation of glandular tunnel. The third figure shows urethra brought up through the glandular tunnel and sutured. The disadvantage of this operation is that it causes shortening of the penis.

are equally as important as the type of operation used, and the success or failure in any case is determined as much by the former as the latter.

The most important rules to observe are:

1. Absolute asepsis during and after operation.

2. Avoidance of tension on sutures.

3. Maintenance of adequate circulation in all skin flaps used.

4. Allowance for contracture of all skin flaps.

5. The least complicated operation is most likely to be successful.

6. No hair-bearing skin should be used to construct the new urethra when avoidable.

Following operation, infection is the *bete noire* of all surgeons. If this is superficial it is usually controllable by wet antiseptic dressings. But most often it originates in the newly constructed urethra; and it is characterized by the appearance, at some point along the line of suture, of a small area of induration, reddening and tenderness, usually about 1 mm. in diameter. Within seventy-two hours a small area of suppuration develops, which, when opened, yields a few drops of pus, in which staphylococcus aureus or albus is usually found. The result of this is a fistula which is pin point in size.

The origin of such areas is not exactly clear but the probability is that skin used to construct the new urethra harbors a few cocci which subsequently infect the wound.

In the attempt to prevent this, one should inject, once or twice a day, some non-irritating and penetrating antiseptic into the new urethra. In doing this, care should be taken not to insert the instillation under pressure as there is danger of rupturing the line of suture. A medicine dropper one-half full is usually sufficient, and mercurochrome is an excellent drug, as it is non-irritatiing, disinfectant, and penetrates the tissues deeply.

Another precaution against infection is the fastening of the penis to the abdomen. This has the double advantage of preventing foldings and creasings of the skin along the line of suture and of giving free access to continuous wet dressings. This can be accomplished by a suture of silk or silver wire through the prepuce and abdominal skin. Often, however, this manoeuvre is painful and even unsuccessful, due to erections. This can be remedied by the insertion of separate stitches in the prepuce and abdominal skin and fastening between them an elastic band. Thus when the erection occurs the band stretches, and when the penis become flaccid again it contracts but in all conditions, it holds the penis up in the desired position.

Another frequent cause of infection starting inside of the new urethra is the premature passage of urine through it, caused by stoppage of the perineal drainage tube—due to plugging or kinking. This is best obviated by a deep suture encircling the urethra, and placed between the perineal drainage tube and the site of the plastic. This suture should be tied

sufficiently tightly to completely occlude the urethra, but care should be taken that it be not tight enough to cut the urethra. If this should happen, not only would the object of the suture be defeated, but extravasation of urine and periurethral abscess might occur, and stricture result at this point. This suture should be left in place until the plastic is well healed, and the perineal tube removed.

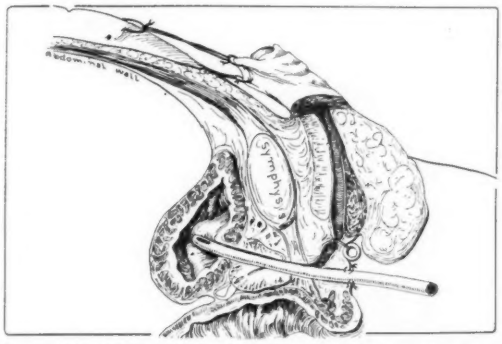

Figure VI.—Shows suture of penis to abdominal wall by two silver wire sutures in abdominal wall and two in prepuce between which is stretched an elastic band. Also shows occlusion of membranous urethra by suture surrounding it. This is to prevent passage of urine through anterior urethra. Also shows tube inserted into the bladder through external urethrotomy wound and sutured by two interrupted double medium silk sutures.

The avoidance of tension in the suture of all flaps must be scrupulous. If this is ignored there are several factors which will contribute to the failure of the operation. The first of these is the edema which follows within forty-eight hours after the plastic. This will cause the sutures to cut, and the plastic to disintegrate before healing has commenced. Tension also causes diminution in the blood supply of the flap because of the constriction of the vessels, thus predisposing to sloughing. And, finally, if there is tension, there is great probability that when cicatrization and contraction occur in the healing, the wound will be pulled open. These considerations make the avoidance of tension of paramount importance.

The maintenance of adequate blood supply to all flaps is self-evident, and, therefore, requires no explanation. If due diligence is not exercised in this, sloughing will occur with consequent loss of the plastic. One should always, therefore, leave a broad pedicle for the nourishment of flaps, and in the undermining of skin edges, one should be as conservative as possible and the dissection should be carried no further than is absolutely essential.

It is often surprising the degree of shrinking and contraction that occurs in a flap after it has been dissected free. This is particularly true in the skin of the penis and scrotum, and if the surgeon is not careful to allow for this, he is embarrassed to find that the flaps mobilized are insufficient for the purpose for which they are designed. To this end, it is wise to have the incisions at least one centimetre distant from the midline in the Duplay operation for construction of the penile urethra. Also, if allowance for contraction is not made, tension in the suture line results, as shown above, and there is imminent danger that the wound will break down.

The utilization of flaps of skin containing hair is to be avoided because urinary salts are prone to be deposited around them, with resulting stone formation. From this standpoint, it is inadvisable, therefore, to do any operation of this nature in which the skin of the scrotum, as in Bidder's operation, or where the skin of the pubes, as in Rosenberger's operation, has to be used.

The rationale for the attempt to correct hypospadias may be placed in two categories: (a) the anatomical restoration of the parts to normal, and (b) the functional benefits derived.

The anatomical anomalies to be corrected are the correction of chordee, with concomitant lengthening of the penis; restoration of the urethra, so that the meatus is situated in the glans; and the correction of the bifid scrotum, when present.

The functional benefits to be desired are dependent upon the anatomical corrections outlined above. They are micturition through the normal channel, and potency.

In any case of hypospadias, the operation indicated depends on the degree of deformity present. For this reason, the classification of hypospadias given by Duplay is helpful. He divided the condition into the following types:

A. Balanitic: The urethral meatus is in the coronal sulcus.

B. Penile: The orifice of the urethra is between the glans and the peno-scrotal junction.

C. Peno-scrotal: The hypospadias opening is at the peno-scrotal junction.

D. Perineo-scrotal: Here the meatus is in perineum or scrotum, the latter being of the bifid type.

Since 1908 there have been twenty-eight cases of attempted repair of hypospadias in the Brady Urological Institute. An analysis of these cases is naturally divided into several

XUM

headings, namely, the methods used to correct the chordee, restore the glandular and penile urethra, and the results of each as regards the permanence of the plastic.

As a preliminary to operation both for the correction of chordee and plastic repair, a perineal urethrotomy was done in twenty-four cases. In one case a catheter was placed in the bladder through the hypospadias opening, no attempt being made at the time of the plastic to anastomose the new urethra at the site of the hypospadias opening. In this case the plastic healed *per primum* except for a small fistula near the glans where the new urethra was sutured to it. Four months afterwards the new urethra was anastomosed at the hypospadias opening and a retention catheter inserted through the external meatus. The result was excellent, and the wound healed. However, it is obvious that perineal drainage will allow the entire plastic to be done at one sitting, and, also, the urethra can be occluded by a circular ligature anterior to the tube, making it impossible to soil the wound with urine. In the last seven years all cases have had perineal drainage, and there is little reason to doubt the advisability of this procedure. An added advantage of this is that if stricture should occur at the site of the plastic following operation, the perineal wound will sometimes act as a safety valve, and drain, thereby preventing retention of urine. This has occurred in two cases. After dilatation of the stricture the perineal wound healed readily.

In practically all cases of hypospadias there is downward curvature of the penis, with marked shortening. In the majority of cases this is due to absence of the corpus spongiosum, plus the formation of a fibrous band on the under surface of the penis, although there is evidence that contracture of the corpora cavernosa occurs in some instances. It is, therefore, necessary to perform a preliminary operation on the penis to straighten and lengthen it. The procedure which has been uniformly successful is a transverse incision of the skin of the penis and Buck's fascia, with thorough dissection of all constricting fibrous tissue of the intercavernous septum. It is not often necessary to divide into the corpora cavernosa to attain the desired lengthening, and one should usually exercise precaution to prevent doing this because troublesome hemorrhage occasionally results. The wound is closed longitudinally according to the Heineke-Mikulicz principle, and the penis sutured up to the skin of the abdomen. (Fig. 7).

Of the three cases showing the glandular type of hypospadias one was corrected by the Russell method, and one by the Duplay method. Both of these operations were entirely successful and a satisfactory glandular urethra obtained. The third case was a small boy, aged six, whose urethral orifice lay in the coronal sulcus. This orifice was pin point in size and would scarcely admit a silver probe and he voided a very small stream with slight straining. It was believed that he was too young to attempt a plastic repair and that the only immediate indication was to enlarge the urethral orifice. Therefore, a small knife was inserted through this opening and an incision made on the dorsal aspect of the urethra. In this fashion the orifice was enlarged to such

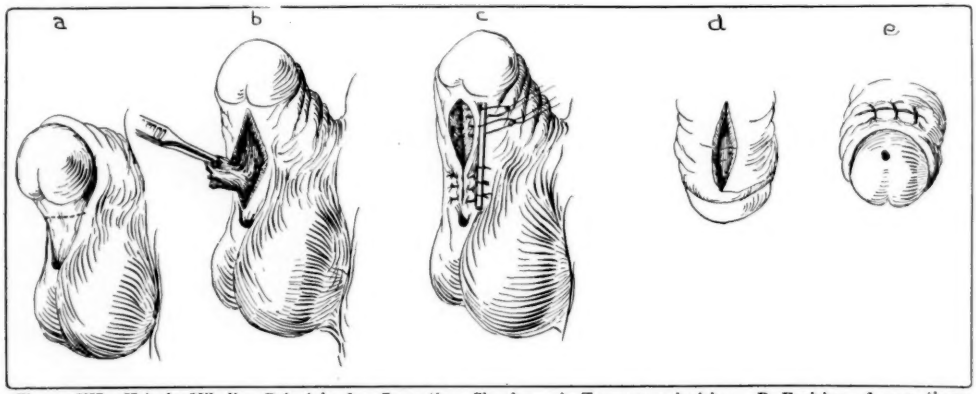

Figure VII.—Heineke-Mikulicz Principle for Correcting Chordee. A. Transverse incision. B. Excision of scar tissue in intercavernous septum. C. Closure longitudinally. D. and E. Shortening of dorsal surface of penis according to Heineke-Mikulicz's method which is necessary in some cases. Incision longitudinally, closure transversely.

a degree that a 22 French sound could be readily admitted, and the opening of the urethra was not made to occupy a position on the shaft of the penis, posterior to that point at which it was formerly located. This procedure therefore allows one to enlarge the urethral orifice without exaggerating the hypospadias.

For repair of the glandular urethra in connection with more serious grades than the simple glandular type, the following methods have been used: In two cases, no attempt was made to have a glandular urethra, an opening in the coronal sulcus sufficing.

In three of the earlier cases the prepucial flap method was used. On all of these the tube "took" nicely, and there was no sloughing, but a fistula resulted at the point of anastomosis of the prepucial tube and the new urethra, which it was necessary to close later. In one case glandular and penile urethra were constructed with a Tiersch graft. This healed well, and no fistula occurred in the glandular urethra. In one case a tube was made with a prepucial skin graft. This also gave an excellent result. No fistula or sloughing occurred.

In one case skin flaps were turned down from the abdominal wall, after the method of Rosenberger (Figure VIII).

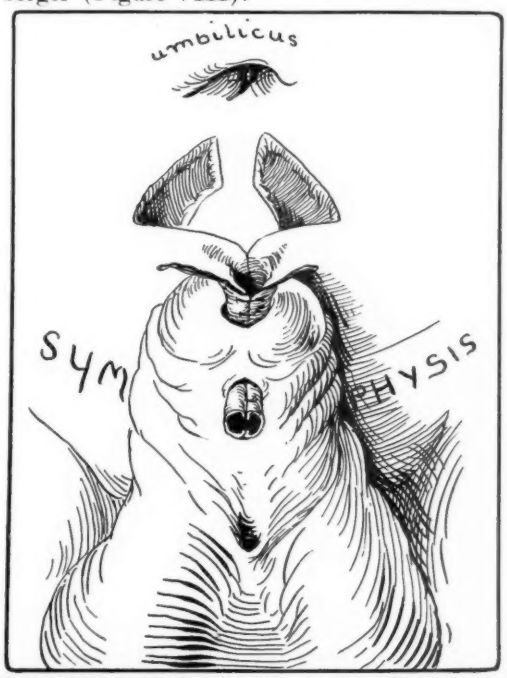

Figure VIII.—Rosenberger Operation for Formation of Glandular Urethra. Shows flaps of skin raised from abdomen and sutured to form a tube which is inserted through the glands.

In this case the flap healed well, but a fistula resulted at the point of anastomosis of this tube to the new urethra.

Russell's operation (Figure IX) was performed in seven cases.

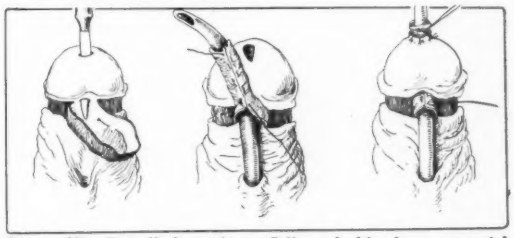

Figure IX.—Russell Operation. Collar of skin from prepucial hood is brought over the glans and sutured to make a tube and inserted upward through a tunnel made in the glans. This operation is often used in conjunction with the Duplay plastic for the formation of penile urethra.

In two cases healing was perfect. There was one fistula in one case, two fistulae in one case, three fistulae in one case and in two cases the plastic was unsuccessful because the lumen did not remain patent.

In ten cases the method of Duplay (Figure II) for the glandular urethra was used. In six of these cases healing was *per primum*, and the urethra remained open. In two cases the wound broke down due to infection. The origin of this in one case was the stoppage of the perineal tube with passage of infected urine through the new urethra; in the second case, the cause of infection was not determined. In two cases healing was such that the tube was not formed. This is caused by the edges of the inner tube healing to the outer edges of skin, so that no urethral tube is formed, and the glans returns to the same condition as before operation.

At first glance it would seem that the operations, such as those of Russell and Rosenberger, in which a tube is made from prepucial and abdominal skin flaps, have been more successful than the Duplay operations. However, in those operations, while the glandular portion has healed in practically all cases, the anastomosis of these tubes with the newly made penile urethra has been complicated by a fistula at the point of junction in every case, requiring closure.

It seems, therefore, that approximately the same result will be obtained by all of these methods, and that they are all very satisfactory for the formation of the glandular urethra. The Duplay principle is the least complicated and, since it gives excellent results, it has been used in the last six cases.

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Survey of the different types of hypospadias which have come to operation shows that the peno-scrotal and mid-scrotal types together have occurred eighteen times in twenty-eight cases. The penile type in five cases; penile fistula, excepting post-operative fistulae, twice; and the glandular type in three cases. In the two cases of penile fistula, both were closed by skin flaps made from the sides of the fistula according to the Duplay principle. Both of these cases healed except small pin point fistulae at the site of the previous congenital fistula. These post-operative fistulae have been pin-point in size, and are easily closed.

The penile type of hypospadias has been corrected in five cases, four by the Duplay method, and one by turning up a flap from the scrotum. In two cases the result has been satisfactory in that the plastic healed, although one had one small pin-point fistula and one had two small openings at the site of the original hypospadias opening. One case voided around the perineal drainage tube three days after operation, the urethra anteriorly not having been occluded by a circular suture. A peri-urethral abscess developed, causing the plastic to disintegrate. The fourth case did not heal because too much tension was placed on the line of sutures, the skin not being sufficiently redundant to allow the flaps to be sutured without tension.

In eighteen cases of complete hypospadias, a flap of scrotal skin was turned up to form the new urethra in one case and a tube graft of skin was used in two cases. In three cases the operation advocated by Tiersch for epispadias was used, and in twelve cases the Duplay principle was employed.

In the case in which the flap was turned up from the scrotum, a Duplay plastic on the glans and a Heineke-Mikulicz for lengthening the penis was first done. Nine months later the repair of the urethra was carried out. The operation was as shown in the accompanying sketch (Figure X).

The result in this case was that the plastic healed well, but two small fistulae developed, one at the peno-scrotal junction, and one at the junction of the scrotal flap and glandular urethra.

In the two cases in which skin tube grafts were sutured over a catheter and inserted through a subcutaneous tunnel between the glandular meatus and the hypospadias opening, the results were also good. In one case an attempt was made to anastomose the skin tube to the hypospadias opening at the time of the plastic; in the second case it was left unat-

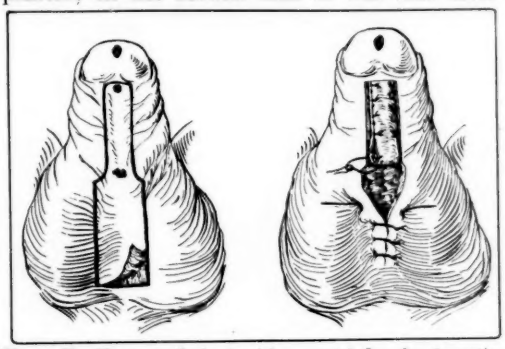

Figure X.—Shows method of raising scrotal flap for formation of penile urethra. Suture of new urethra with interrupted Lembert suture.

tached and the anastomosis performed nine months later. In both cases the grafts healed well, and, of course, no fistula developed in the penile urethra, but in both cases small fistulae developed at the point of anastomosis of the skin, tube and hypospadias opening. One of these cases yielded to dilatations with sounds and when last seen, five years after operation, a 24 F. sound could be passed from the meatus to the bladder. No fistulae were present. The second case has not been seen since his discharge from the hospital.

In three cases in which the Tiersch method (Figure I) was used there was healing of the plastic throughout except in one case three small fistulae resulted, one at the site of the peno-glandular anastomosis, one at the mid-penile portion of the urethra, and one at the peno-scrotal junction. In the second case, one fistula occurred at the peno-scrotal junction, which was present on discharge. The patient was instructed to return to have this closed, but he never did. In the last case the healing was *per primum* except one fistula at peno-scrotal junction. When seen two months after discharge no fistula was present, and he voided without difficulty. Fourteen months after operation a stricture resulted at the peno-scrotal junction. This caused the perineal wound to break open, but it closed immediately after the stricture was dilated.

The last twelve cases operated upon by the Duplay method have been separated from the above three cases in this analysis in order to determine whether any advantage is attained by the slightly more complicated method of Tiersch, in which the line of sutures are not

in apposition, and all sutures are tied outside.

An analysis of these cases shows that none of them healed completely, and, on the other hand, none broke down completely. In ten cases the healing was complete except for the formation of small fistulae. In four of these cases one fistula resulted; in three instances at the peno-scrotal junction, and in one at the retroglandular portion. In four cases two fistulae occurred. In all of these, one fistula was at the peno-scrotal junction and one at the mid-penile portion of the urethra. Three fistulae occurred in two cases, one of which was immediately behind the glans, one in the mid-penile portion of the urethra, and one at the peno-scrotal junction. In one case one-half of the plastic broke down.

Difficulty in making the perineal urethrotomy wound close has been encountered only twice. In both of these cases, stricture at some point of the plastic had occurred, the dilatation of which had affected the closure of the perineal fistula.

still had complete cure, with no fistula, and all of the urine was being voided through the new urethra. In two cases the result is not known. In two cases the success was partial. These cases had two or more fistulae, and closure of one or two has been successful. One of these cases is still under observation and will have the last fistula closed in the future.

The final summary of results obtained can be seen in the following table:

The inferences that can be drawn from the above analysis are practically limited to consideration of the cases done by the Duplay method, because other methods have been tried in so few cases that the results attained do not lend themselves to deductions.

The seventeen Duplay operations, however, show some instructive points. We know that any type of hypospadias is remediable if attacked with patience. Even the simplest cases usually require several operations before the defect is remedied and all fistulae closed, and often in the severe types it is necessary to

RESULTS OF OPERATION IN 28 CASES OF HYPOSPADIAS.

Type of Hypospadias	Glandular	Penile	Penile Fistula	Peno-Scrotol & Mid-Scrotal
Number of cases	3	5	2	18
Complete cure in 1 operation	3	0	0	0
1 Post-operative fistula		1	2	Duplay 4, Tiersch 1, Mayo 1, Rosenberger 1, Skin tube graft 2.
2 Post-operative fistulae		1		Duplay 6.
3 Post-operative fistulae				Duplay 1, Tierach 1.
Complete disintegration		2		1 (One-half broke down).
Result unknown				Duplay 1.
ULTIMATE RESULT.				
Complete cure		1		Skin tube graft 1, Tiersch 2, Duplay 6.
1 Fistula	2	1		Skin tube graft 1, Duplay 4.
2 Fistulae				
3 Fistulae				
Failure of plastic		2		Duplay 1—due to erections.
Patient lost		1		Rosenberger 1, Duplay 2.
Death				Duplay 1, followed by influenza and bronchopneumonia.

So much for the immediate result of operation. The true criterion, however, is the ultimate result, and, although fistulae are prone to occur, the operation is justified even if these could not be closed at a later date, because they are, in the vast majority of cases, pin-point in size and only a few drops of urine escape. However, in nine cases in which closure was attempted, complete success was obtained in seven cases, and when last seen these patients operate four or five times before all fistulae are closed. Therefore, one should not be discouraged if a perfect result is not obtained immediately. This has not occurred a single time in the above cases, but it will be seen that in twenty-five per cent (seven cases) a complete cure was effected before discharge; twenty-one per cent (six cases) had only one small fistula when discharged, thus making forty-six per cent practically cured. Ten per cent (3 cases)

XUM

have been lost, but these were discharged with only one small fistula, and the probability is that they have since closed. Therefore, a complete cure can be expected in from sixty to seventy per cent of all cases if patience is exerted, both on the part of the individual and by the surgeon. Great care must be taken to abide by the fundamental rules of plastic surgery on the part of the surgeon. If this is done, any of the above operations may be expected to give good results, but if these principles are ignored, no amount of ingenuity in the operating room can hope to bring success.

I am deeply indebted to Dr. Hugh H. Young for his permission to use these cases for this study. Many of them were from his private practice and all of them were on his service at the Brady Urological Clinic.

312 *Medical Arts Building.*

DISCUSSION.

DR. J. SHELTON HORSLEY, *Richmond*: Dr. Bidgood has gone into the subject quite thoroughly and has given an excellent paper. I have had several cases of hypospadias in the last few years and I find that the type of operation in which the flap is taken chiefly from one side of the groove where the new urethra should be is very satisfactory. In this manner the flap can still be left partly attached to the groove and turned over so that the suture line is posterior, or at least in a posterior lateral position, and not directly under the median line. This is an added protection against breaking down. In addition, the end of the flap may be extended around the prepuce to the dorsum of the penis, if it is dissected in different stages and not all at one time. This principle of training the blood supply by operations at different stages insures the vitality of the flap and is a very important principle in plastic operation. In this manner the flap can be made long enough to reach fully to the tip of the glans penis and so will avoid the embarrassing leaks that often occur at the margin of the corona on the under surface.

SOME ANATOMICAL CHARACTERS OF THE MONGOLIAN IMBECILE.*

By R. BENNETT BEAN, M. D., University, Va.
Laboratory of Anatomy, University of Virginia.

The feeble-minded white child who resembles the Mongolian adult, and resembles even more the Malay adult, has been of considerable interest for about 100 years. This interest was centered around the ethnic relationship after the work of Chambers, "Vestiges of the Natural History of Creation" in 1844, and the elder Langdon-Down, "Observations on an Ethnic Classification of Idiots" in 1866; and it was brought out recently by a little book of Crookshank, "The Mongol in our Midst." Many others have studied the Mongolian imbecile. Hunter measured thirty-six and Davenport examined many more. In Davenport's recent work on the "Influence of Endocrines on Heredity," he brings out clearly some of the diagnostic traits in Mongoloids through an antropometric analysis.

It was my good fortune to examine about 100 of these "unfinished children," as they are called by Shuttleworth, while measuring the children at the Training School in Vineland, New Jersey, during the past summer. Measurements were made and descriptions recorded, with the addition of X-rays of the cranial sutures from three directions, and X-rays of the bones of the extremities. The type of ears, nose, face, head and body form was determined from their morphology. The statistical study is not yet complete, but enough has been done to justify a preliminary resume.

CHARACTERS.—Their chief characteristics are small stature, great relative sitting height, short arms and legs, broad and short hands and feet, single transverse hand-lines, short thumbs and short in-curved little fingers, the middle phalanx shorter than the terminal, prehensile great toes, small ratio of lower to upper arm length, small span and chest girth, high omphalic index, markedly broad and short head which is globular and sometimes flattened behind, involuted ears with adherent lobules and overturned upper helix, nose of the Hypomorph type, Mongoloid eyes, laxity of muscles, over-flexible joints, presence of the metopic suture, wide-open sutures with fontanelles, small epiphyses which remain ununited late, simple gyri and sulci of the cerebrum with small cerebellum and brain stem, rough, dry skin, scrotal tongue, defective retina and impaired vision. Many other characters could be enumerated but these are the most important.

DISCUSSION.—The condition of true Mongolism is not so much abnormal development as incomplete metamorphosis. The Mongolian imbecile is the true Hypomorph of the Whites, and thus represents relatively the same type as the Negrillo and Negrito for the Blacks, and certain Malay, Mongolian and other peoples for the Yellow-Browns. I had never seen a true Hypomorph among the Whites until I first saw a Mongolian imbecile, and the discovery was a surprise. The cretin and the achondroplastic dwarf have some measurements similar to those of the Mongolian, but they

*Read at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

are not Hypomorphs, although they seem to be nearly related to them. All Mongolian feeble-minded children are not alike, and they vary from those who show all the typical traits to those who have only one or two of the characters, or who have the characters to only a slight extent. Cretins and achondroplastic dwarfs sometimes look Mongoloid.

Very few Mongolian children are idiots, and a considerable proportion attain the mental age of three or four years or even older, and some Mongoloids pass as normal, especially among women. The large part are imbecile, or near imbecile, therefore Mongolian imbecile is a better term than Mongolian idiot.

The tissues of the body in Mongolian imbeciles do not complete their metamorphosis, and even the cells seem to be unfinished or imperfect. Not one of the systems, bone, muscle, brain, skin, and others, have a natural function. The epiphyses of the bones are small and unite late if at all, and the joints are over flexible. The wide-open sutures of the skull, with fontanelles, and frequently the persistence of the metopic suture in the frontal bone, with the small brain and its simple gyri and sulci, and undeveloped cerebellum and brain stem, in conjunction with the simplemindedness denote incompleteness of development. The retina is incomplete, with impaired vision; the tongue is fissured radially from the midline; the lips are cracked and the eyelids inflamed. These are but a few of the many characters that could be cited in support of the statement that the condition is one of incomplete metamorphosis.

Causes.—Crookshank derives the condition of Mongolism from the orangs through the Mongols who early invaded Europe and left their impress upon the people which has been handed down since that time. He thus carries out to some extent the exploded theories of Klaatsch who derived the different races from different lines of anthropoid apes, although his theory has been modified by his followers. The work of Crookshank follows that of Chambers and the elder Langdon-Down, as well as many others who would derive the Mongolian imbecile among Whites from a previous mixture of Mongols and Europeans.

Mongolian imbeciles are found frequently to be the children of Mongoloid parents, the children of tubercular parents, or the first of normal parents, or the last of a large family, all the others being normal. The correlation has not been calculated for any of these conditions on a sufficiently large number, however.

Recently the endocrine glands have been brought in as the cause. This is natural today when our ignorance of the endocrines makes them a popular cover for other ignorances and negligences. A low grade lymphatic development, poor thyroid secretion, and deficient secretions of other glands have all been claimed as the cause. Davenport concludes that the chromosomes are the determiners of development, first by altering the quality and activity of the particular secretions, "under conditions imposed by environment, and then, as it were, turn over to the 'gland,' for better or worse, the functions that control many of the later developmental processes."

This all seems to mean that nobody knows the cause of Mongolism and anybody's guess is as good as another's. Pluriglandular deficit seems to fit it as well as anything else, and with reason, because all the tissues being deficient, the endocrines would also be deficient. The condition must start in the embryo or fetus because fetal and embryonic conditions may be retained. The persistence of the metopic suture, patent foramen ovale, hairy face and body, and defective pigmentation are but a few of the features retained.

I am inclined to agree with Dr. Robert Hutchison, of London, that mental deficiency arises fortuitously, and that each generation would continue to produce its crop of such children. Alcoholic conceptions, syphilitic heredity, and degenerate ancestry produce their effects, but we need more detailed and numerous studies before the question will have a basis of fact for settlement.

Nature has a way of producing extremes as well as intermediate conditions, and through this variability many situations may be suited. The Mongolian imbecile may come into its own sometime in the same way as the Negrillo and Malay by adaptation.

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XUM

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THE ROENTGEN RAYS IN UROLOGY.*

By JAMES W. HUNTER, Jr., M. A., M. D., Norfolk, Virginia.
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In the modern conception of clinical medicine every clinical symptom has a demonstrable pathological cause. It is exactly like the clock. If there be some error in its mechanism, we shall have an imperfect time-piece; and conversely, if we have imperfect time, we shall find some imperfection in the mechanism. There are no physiological pains except those of labor. And so, given a clinical case, we shall, if sufficient time and energy be expended, find a demonstrable pathological lesion, though often this is only to be found at autopsy and sometimes only by the most exacting microscopical technique.

Especially is this true of renal colic. Here we have a chain of symptoms of a distinct and definite nature, generally the most exquisite pain radiating from the lumbar region, often downward and forward into the anterior abdomen and even into the genitals. In many of the text books you will find the positive assertion that pain in the male subject will extend into the head of the penis; but from an examination of possibly two thousand cases (over half of them being males), I may assure you that pain in the head of the penis is generally not the result of a primary renal colic. This condition was formerly supposed to be due to the passage of a calculus through the ureter. Its sharp sides cut the mucosa as it descended. But, though this is often the case, we must abandon such a conception and recognize a more logical cause. In short, it is the stretching of the capsule surrounding the kidney by the damming back of urine that causes the trouble. And this may result from one of many causes.

Any congestion of the parenchyma causing a stretching of the renal capsule will cause a violent nephritic colic. In the pre-Volstead days I have seen this as a result of the ingestion of beer. The patient, a physician, was in agony many hours. No calculus was ever found or passed and a return to normal living with an abstinence from liquor soon made a cure. I also recall a case of interstitial nephritis that I twice examined for renal calculus. Even haematuria resulted. Yet upon operation no calculus was found and a decapsulation relieved. Similarly, we may have the old familiar tubercular kidney. If the organ still functions and there is no method of drainage, we may expect, and do have, intense suffering. Upon the other hand, if there be no pressure, even though a large calculus exists, no pain results and often these cases go unrecognized or are vaguely diagnosed as cystitis.

A damming back from below will also cause an attack of nephritic colic. Indeed, it is to this class that the great majority of cases belong. Ureteral kinks or stenosis, hydronephrosis or floating kidney, kidneys, as it were, that so far deviate from their normal position as entirely to obliterate the lumen of the ureter, may be and are productive of the greatest misery. Of this condition I have seen many cases; with the aid of the cystoscopist and the injection of an opaque material, I have been able to make many diagnoses. I remember one case in my early work. A young lady suffered with severe pains of an indefinite nature, which a distinguished surgeon in another city had declared to be of an ovarian origin. Yet upon operation no lesion was found in the ovary and a kinked and stenosed ureter gave the clue to the diagnosis. But right here let me sound a note of warning. Do not inject the kidney with too much force. The average pelvis will only hold from 12 to 15 c.c. of fluid. You may inject by means of the syringe, or you may use the gravity method. Personally, I prefer the syringe. Inject until the patient complains of a moderate pain in his kidney region. Then radiograph him. Then remove the fluid with the injection syringe. We formerly used a solution of some salt of silver. First we used argyrol, only to abandon it. Then we tried collargol. Eisenwrath made some studies and found that it was absorbed by the blood and distributed. There was an ever present danger of infarction. We abandoned this also. Next we tried a solution of thorium, but we found only that solution made by a certain firm of value. Of late, the bromide or iodide salts of soda are proving eminently satisfactory. They are used in a solution of from 20 to 25 per cent. Possi-

*Read by invitation before the Staff of the U. S. Naval Hospital, Norfolk, Va., October 29, 1924.

bly, however, the iodide salt is slightly less irritating.

As we have said above, any obstacle to the free drainage of the urine from the kidney, as a calculus in the pelvis of the organ, a kink of the ureter, or a stoppage from below, will result in a typical attack of nephritic colic. Consequently, we must first assure ourselves whether or not a calculus exists. We shall examine the entire urological system; we shall note particularly the size, shape and position of the kidneys. By far the most common cause is the small ureteral calculus. But we must not overlook the calculus so commonly found in the kidney. If the calculus is small and lies in the pelvis of the kidney, it is most probable that its simple removal with the repair of the pelvis of the kidney will restore the patient promptly to health. But even then the re-formation of the calculus is to be entertained. Likewise, we must remember that a neglected calculus in the pelvis of the kidney will often grow to alarming proportions. It will involve the parenchyma of the kidney. This will break down and suppurate. I have seen many cases of this kind. The referring surgeon and I have urged immediate operation. The family physician and patient have demurred. Death has resulted. Again, the operation has been delayed with a resulting septicemia and the loss of the kidney. Or, even again, an abscess has occurred with the formation of a persistent sinus in the back. Such a case I recently saw. An injection of bismuth paste gave the clue. The sinus extended into the kidney, which was full of calculi. Fortunately, the left kidney was intact and a nephrectomy cured the patient.

We often see some very puzzling cases. The largest calculus that I have ever found was in a mill operative from a small town in Eastern Carolina. He complained of a vague pain of an especial bearing down nature. I was asked to examine him on general principles. I found a calculus somewhat larger than the average hen's egg. The right kidney was entirely gone. Another case was that of a prominent grocer. This man had complained of night sweats. His lungs had often been examined; even in the absence of physical signs, fever or loss of weight, tuberculosis was suspected. He went the usual round of doctors. He suffered no pain. On account of a trace of albumin in his urine I was asked to examine him. I found a curious case of a kidney filled with calculi of a typical dumb-bell and mushroom shape. I attended the operation, a nephrectomy. No pus or breaking down of the parenchyma was found, though the amount of kidney substance yet remaining was exceedingly small. Another case suffered with typical symptoms which were so pronounced that, even in the face of negative roentgenological evidence, he was operated upon. He got no relief. A shadow of the gall-bladder, however, had been noted on the plate. A second operation, a cholecystectomy, relieved the patient.

I might quote interesting cases almost without end. A review of over two thousand cases would furnish much food for thought. But I would urge upon you the details of a differential diagnosis. Especially do I refer to the differential diagnosis between nephritic colic and a pathological gall-bladder. Almost any symptom of clinical gastro-enterology may suggest a cause. Unfortunately, only a small percentage of biliary calculi can be shown on the roentgen plate. But, following the work of George and with a technique developed independently, I have been able in some three hundred cases to demonstrate a pathological gall-bladder. These diagnoses have been proved at operation. It is upon the principle that every gall-bladder, which throws a shadow on the roentgen plate, is a pathological one, though not necessarily a surgical one. Recently Graham by his intravenous injection of a solution of tetrabromophenolphthalein has been able to show the gall-bladder in more detail. In his work a negative shadow is to be interpreted as due to on obstruction in the hepatic or common duct. So we shall examine both the urological system and the gall-bladder. If the urine itself is negative and no pathology can be obtained of the kidneys or ureter roentgenologically, we must look to the gall-bladder. Here the shadow of the organ upon the roentgen plate will establish the diagnosis.

Nor shall we forget that a great number of cases complain of pain at or near McBurney's point. A differential diagnosis between ureteral colic and appendicitis must be made. I have seen many examples of mistaken diagnosis. And, while I do not care to be dogmatic, I think that the diagnosis may easily be made as follows: If the kidneys and ureters are roentgenologically negative and if in the male the prostate can be eliminated, we are probably dealing with a pathological appendix. We shall prepare the patient for the

XUM

urological examination. If this is negative, we shall use the opaque enema and determine very definitely whether there exists any filling defect in the caecum or terminal ileum. We may diagnose adhesions and occasionally a tuberculous colon or malignancy. Rarely will the appendix itself be visualized. Or, failing in this, if the case be not too sick, we may give the opaque meal (I prefer barium and buttermilk), and observe the appendicular region at the sixth, twenty-fourth and twenty-eighth hour period. I am frank to tell you that my own work upon this line has been extensive; but I fail to agree with many of my confreres that the fluoroscopic examination of the appendix is of much value and I feel that the palpating spoon, introduced some ten years or more ago, is an instrument worthless, dangerous and to be discarded.

To the question of nephrolithiasis and uretero-lithiasis we may add that of the diagnosis of calculus of the bladder. This is, of course, comparatively easy. It may be made either by the cystoscopist or by the roentgenologist. Perhaps, however, it is best made first by the roentgenologist. While the catheterization of the female bladder is comparatively easy and likewise the introduction of the cystoscope, the same procedure on the male is often attended by extreme difficulty and sometimes with risk. But even here the exact position of the bladder must be recognized. Some years ago, in a neighboring city, a diagnosis of a calculus in the bladder was made from a plate showing two small phleboliths above the border of the pubes. Operation was performed, but no calculus found. Disgusted, the patient consulted me. The roentgenogram showed two small phleboliths. I had no difficulty in recognizing a case of specific urethritis and referred the patient to a competent urologist. The process had involved the seminal vesicles, prostate and neck of the bladder. Under proper treatment the patient recovered. Yet the surgeon could not understand why no calculus had been obtained through the suprapubic incision, when two were shown on the plate. He wrote me. The explanation was simple. The plates had been made by a female technician and interpreted by a medical man unfamiliar with the normal roentgen anatomy of the bladder.

From the bladder to the outside world we have the urethra. In the female subject this is quite short and presents but little difficulty to the passage of a very small calculus. In the male urethra, however, often attended as it is by strictures and being somewhat long, an occasional calculus is impacted. Of this I have seen but one case. The calculus was impacted at about the middle of the tube and lay just under the lower border of the pubes.

To the question of lithiasis we must add that more interesting one of the demonstrable lesions of the kidney and ureter. By the injection of a solution of an opaque salt, as we have mentioned above, through the ureteral catheter we are able to visualize the pelvis of the kidney and the entire course of the ureter. We are, accordingly, able to make a diagnosis of hydronephrosis, pyonephrosis, tuberculous pyelitis and many of the various anomalies, such as "horse-shoe" kidney, or double kidney, as well as ureteral kinks, stenosis or double ureter. Here again we must depend upon an intimate knowledge of the anatomy of the organ. We must realize that the kidneys normally lie upon either side of the spinal column, being bean-shaped and about four and a half inches in length and that they are very closely associated at the internal or pelvic aspect with the second lumbar vertebra. The one on the right is surrounded by the liver and is, accordingly, hard to visualize; the one on the left is somewhat higher, but is free. The kidney is also divided into a cortical and medullary portion and from the latter are projected several pyramids, the pyramids of Malpighi, while between them lie an almost equal number of calices. These latter are the terminal ends of the three infundibula, the superior, middle and inferior, which in turn unite to form the pelvis of the kidney. This is continued downward by the ureter. It lies almost directly external to the outer aspect of the transverse process of the lumbar vertebrae and descends almost straight until it reaches the upper border or crest of the ilium, where, still descending, it passes first outward and then inward, to enter the bladder at a point almost exactly between the spine of the ischium and the tuberosity of the sacrum.

It is by the size and position of the kidney pelvis that we are able to make a diagnosis. We shall find a distinct dilatation of, and distortion of, the infundibula and calices in the case of a hydronephrosis; a budding in the parenchyma, as of a bunch of grapes, in a pyonephrosis; a distinct blurring or breaking down in a tubercular pyelitis, and a displacement in the movable kidney. We are able also

to recognize any kinks, strictures or dilatation of the ureter. I have often seen a considerable relief from the pains of a hydronephrotic kidney as the result of a simple dilatation of a ureteral stricture together with a renewal of the tone of the kidney. Usually these strictures will occur at or near the uretero-vesical valve or at the uretero-pelvic junction.

Some cases of hydroureter are most interesting. I remember distinctly one case of enlarged and dilated ureter due to the upward and downward passage of a cigar-shaped ureteral calculus. In my student days, as a summer man at the Harvard Medical School, I found at autopsy a case of double kidney and double ureter. Both of the kidney segments were small and united by a band of connective tissue. The pelves were entirely distinct and from them there descended two distinct ureters to the bladder. Lately I have seen roentgenologically two similar cases in my service at St. Vincent's Hospital.

To the injection of the kidney and ureter we must add that of the bladder. We may use, as before, an opaque fluid or we may inflate the organ simply by air. In either case we may look for a contracted or expanded bladder, a diverticulum, a tumor, or a prostatic incursion. This gives us valuable information. Of the prostate itself much may be said, though an attempt to visualize it as such upon the roentgen plate has in my own work not always been uniformly successful. Often numerous prostatic calculi present themselves. Often it exerts a pressure upon the lower ureter, in turn causing an attack of renal colic. Of the latter I have seen many cases. Usually these are in young subjects, the victims of a specific urethritis, though the condition often occurs in older men. The attempt has also been made to inject the seminal vesicles. But the work has not seemed to be of any great value, nor to compensate for the discomfort of the patient or labor of the urologist, though a solution of argyrol is often injected for its therapeutic value. But invariably such solutions are too weak to cast a shadow. And so the procedure has been abandoned. However, what today is considered common sense is tomorrow foolishness and *vice versa*. We can only wait.

Thus, it will be seen that the roentgen diagnosis is the most recent, as well as the most valuable, contribution to the study of urology. The sense of sight is the most perfect of our senses. Seeing is believing. The roentgenologist and urologist will work together. They will neglect no means toward a diagnosis. The history, physical findings, cystoscopic examination, the chemical and microscopical examination of the segregated urines and the phenolsulphophthalein test will each play its part toward the correct interpretation of the roentgenogram. Very narrow, indeed, is he who can see nothing beyond his own specialty. After all it is the patient that we should consider. As doctors of medicine it becomes our duty to study human ailments; as physicians we should endeavor to relieve them. To the immortal discoverer of the roentgen rays we owe an eternal gratitude. It was his privilege to minister to the human race. It was his privilege to bring to those "who sit in darkness and in the shadow of death" a new and greater light. Gathered unto his fathers he now rests upon the bosom of his native soil. "After life's fitful fever he sleeps well."

606 *Medical Arts Building.*

RADICAL SURGERY OF THE MAXILLARY SINUS—STUDY OF TWENTY-SIX POST-OPERATIVE CASES WITH SPECIAL REFERENCE TO DENTAL INJURY.*

By E. T. GATEWOOD, M. D., F. A. C. S., Richmond, Va.

The word "radical" is generally used to differentiate the simple drainage operation through the nose from the oral method, which is in reality not radical, but only a thorough conservative procedure that is indicated in the removal of neoplasms, cysts, pussy granulations or bone necrosis of the sinus.

Caldwell, of New York, in 1893, and Luc, in France, in 1897, described this operation independently of each other. Denker later extended this operation by removing the crista pyriformis which is the junction of the anterio-nasal walls, with the idea of not overlooking diseased tissue in this angle, which usually defeats the purpose of the operation. When a radical operation is indicated, the general contour of the sinus should be the guide in selecting the Caldwell-Luc or Denker method, as the removal of the crista pyriformis is a necessity in order to thoroughly clean out the ex-

*Read at the meeting of the Baltimore Section of the Surgical Research Society, Richmond, Va., April 29, 1924.

ternal compartment, if the sinus is flattened in shape and the nasal wall concaved inward.

Criticism has been made that patients subjected to the Caldwell-Luc or Denker operation complain either of constant numbness, sensation of elongated teeth, persistent pain, or abscess formation with loss of teeth. It is for this reason we have been particularly interested in the post-operative study of these cases.

Permanent injury to the teeth may be brought about, no doubt, by imperfect operative technique in one of three ways: (1) trauma to the peri-dental membrane; (2) removing bone too close to apex of tooth; (3) disregard for the nerve and blood supply.

1. The peri-dental membrane lines the alveolar socket and functions as a bumper protection to the tooth, and when this structure is abused by unnecessary jars in the use of dull chisels or sudden blows in entering the cavity, swelling and edema follow with infection. This is usually what happens when the post-operative patient complains of an elongated sensation of the tooth. In reality the tooth is actually lengthened by the soft tissue changes, and can be demonstrated by proximating the teeth. To avoid such accidents, use should be made of a sharp chisel, or, better still, the motor driven bur.

2. Removing bone too close to apex of tooth: Good judgment and caution are always necessary either when the antral cavity dips low or the tooth presents itself prominently towards the antral floor; the latter is frequently true of the canine. If the smooth sinus floor over-lying the tooth root is broken, opening up cancellous structure, infection is likely to follow with subsequent apical abscess, and a post-operative reinfection of the sinus. This may be avoided by using a dull subperiosteal separater rather than making use of the curette which is so universally advocated. It has been our custom not to use the curette in this particular region at all, and as little as possible in other regions as it is more conducive to hemorrhage, blind work, and trauma.

3. Preservation of the dental nerve and blood supply: The anterior dental nerve courses a canal or a grooved process on the inner surface of the anterior antral wall, and supplies the incisors and canine teeth. The middle dental nerve traverses the anterior wall in a like manner and supplies the bicuspids; the posterior superior dental nerve passes through the posterior wall and emerges along the floor in a direction to supply the three molars, all being derived from the second division of the fifth. While it is impossible to perform either a Denker or Caldwell-Luc operation without severing one or more of these branches, it is readily understood that rich anastomosis takes place between these branches along the upper anterior alveolar processes and the dense plexus of nerves that lie in the cancellous structure beneath the antral floor supplying dendritis to the apical tooth structure. In addition, the infra-orbital nerve supplies branches to the anterior wall, anastomosing with branches from the naso-palatine along the inferior surface. It is sufficient to mention the blood supply is analogous to the nerves, with the exception that the anastomosis in the antral floor is much richer in character.

The dental nerve and blood supply should not be permanently damaged with such adequate development as is shown in this locality. We believe those cases that have the misfortune to be followed by devitalization and apical abscesses can be attributed to injury rendered the terminal apical structure. Such accidents may be enormously lessened if block anesthesia is used, which lends itself to a clean field, slow and painstaking technique.

Impairment of sensation in one or more teeth following operation usually regains itself, though the time is variable. A tooth may be desensitized temporarily, or permanently, without being vitally damaged and judged a pulpless or devitalized structure. For example, the Gasserian operation will desensitize the teeth rather than devitalize or damage the nutritional supply. There is no more reason why interference with the sensory nerve supply to a tooth should devitalize it, than a paralyzed limb should slough from a spinal cord tumor. Clinical and X-ray studies of our cases do not show sufficient post-operative injury to the vascular supply to be followed by devitalization and abscess formation.

Antral disease is frequently secondary to dental infection; therefore, careful examinations were made of the teeth before operation, and removal was done when indicated.

While we know current reactions and X-ray films of the teeth may be subject to many deductions, it is the most accurate means we have at the present time to determine the sensory and structual condition.

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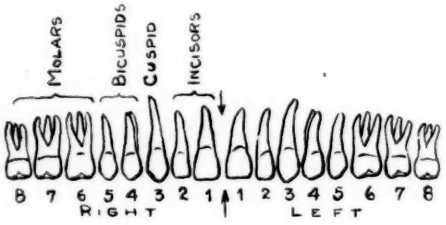
Operation	Electrical	X-Ray	Notation
1. G. H., June 20, 1923. L. Caldwell-Luc.	March 25, 1924. 1 2 3 4 5 6 7 8 + + + + + + + +	Negative	Reactions and sensation normal.
2. G. M. H., May 1, 1923. L. Caldwell-Luc.	March 25, 1924. 1 2 3 4 5 6 7 8 - - + + m m + m	Negative	Nos. 1 and 2 did not respond to current.
3. J. W. W., April 5, 1923. R. Caldwell-Luc.	May 29, 1923. 8 7 6 5 4 3 2 1 m + + + + + + -	Negative	No. 1 devitalized before operation.
4. H. S., April 25, 1923. R. Caldwell-Luc.	May 20, 1923. 8 7 6 5 4 3 2 1 + m c m m + c -	Negative	No. 1 devitalized before operation.
5. W. J. H., May 14, 1923. L. Denker	May 24, 1923. 1 2 3 4 5 6 7 8 + m + + + + + +	Negative	Numbness present. Respond to current.
6. T. M. F., May 12, 1922. R. Caldwell-Luc.	Nov. 3, 1922. 8 7 6 5 4 3 2 1 - + + + + + + +	No. 8 root amputated before operation.	Reactions and sensation normal.
7. H. G. M., March 23, 1923. R. Denker.	April 17, 1923. 8 7 6 5 4 3 2 1 + m + - + + + +		No sensory impairment except No. 5.
8. C. T., April 16, 1922. R. Caldwell-Luc.	April 20, 1923. 8 7 6 5 4 3 2 1 m m + - - m + +	Negative	4-5 Desensitized, apparently vital.
9. A. D. R., April 10, 1923. R. Denker.	May 7, 1923. 8 7 6 5 4 3 2 1 m + + + - - -		1–2–3–4 sensation not yet re-returned.
10. K. H. W., May 10, 1922. R. Caldwell-Luc.	March 6, 1923. 8 7 6 5 4 3 2 1 m m m m m - - -	Negative	1–2–3 Desensitized; apparently vital.
11. G. S., May 11, 1922. L. Caldwell-Luc.	March 24, 1923. 1 2 3 4 5 6 7 8 + + + + + m - +	Negative	No. 7 devitalized before operation.
12. G. S., April 29, 1922. R. Caldwell-Luc.	March 24, 1923. 8 7 6 5 4 3 2 1 + + + m m + + +	Negative	Reactions normal; no numbness.
13. M. F. B., April 16, 1923. R. Caldwell-Luc.	Sept. 2 , 1924. 8 7 6 5 4 3 2 1 + + + + + + + -	Negative	Incisor devitalized before operation.
14. M. W. M., June 6, 1922. L. Caldwell-Luc.	Feb. 10, 1924. 1 2 3 4 5 6 7 8 + + - - - - - -	Negative	Desensitized; apparently vital.
15. W. H. A., May 9, 1921. R. Caldwell-Luc.	Feb. 6, 1924. 8 7 6 5 4 3 2 1 - - m - m + + +	Negative	5–7–8 desensitized but vital.
16. A. V. L., June 5, 1923. R. Caldwell-Luc.	March 25, 1924. 8 7 6 5 4 3 2 1 + + + + + + + +	Negative	Reaction normal. Numbness in No. 1.
17. C. W. T., Oct. 11, 1923. L. Denker.	March 20, 1924. 1 2 3 4 5 6 7 8 + - + + - + + +	Negative	Sensation returned except 2 and 5.
18. C. U. M., July 17, 1923. L. Caldwell-Luc.	March 10, 1924. 1 2 3 4 5 6 7 8 + + + c - + + +	Abscess of 2nd bicuspid.	Reactions normal in others.

	Operation	Electrical	X-Ray	Notation
		April 1, 1924.		
19.	M. H. D., Oct. 12, 1921. R. Caldwell-Luc.	8 7 6 5 4 3 2 1 + + + + + + + +	Negative	Reactions and sensation normal.
		March 28, 1923.		
20.	C. L. H., March 30, 1921. L. Caldwell-Luc.	1 2 3 4 5 6 7 8 + + + + + + + +	Negative	Reactions and sensation normal.
		March 28, 1924.		
21.	C. L. H., Nov. 18, 1922. R. Caldwell-Luc.	8 7 6 5 4 3 2 1 m m + + + + - +	Negative	Desensitized lateral incisor.
		March 22, 1924.		
22.	A. S. P., Jan. 23, 1924. R. Caldwell-Luc.	8 7 6 5 4 3 2 1 m m + c c + + +	Negative	Reactions normal. Some numbness.
		March 24, 1924.		
23.	C. W. H., May 10, 1923. L. Caldwell-Luc.	1 2 3 4 5 6 7 8 + + + + m m + m	Negative	Incisor numbed. Reaction to current.
		March 20, 1924.		
24.	A. S. G., March 10, 1924. R. Denker.	8 7 6 5 4 3 2 1 + + + + - - - -	Negative	1–2–3–4 show negative reactions.
		March 24, 1924.		
25.	O. O., Jan. 24, 1922. R. Caldwell-Luc.	8 7 6 5 4 3 2 1 + + + m + + m m	Negative	Normal reactions and sensation.
		March 24, 1924.		
26.	O. O. H., Feb. 7, 1922. L. Caldwell-Luc.	1 2 3 4 5 6 7 8 + + m + + m + +	Negative	Normal reactions and sensation.



Code:
† Sign indicates electrical response equal in degree of sensation to control or non-operated side.
— Sign indicates absence or impaired sensation as compared with control side.
c Indicates a crowned tooth.
m Indicates a missing tooth.

Comment.

Cases 1, 3, 4, 5, 6, 11, 12, 13, 16, 19, 20, 22, 23, 25, 26 gave good normal nerve reactions; that is, they responded to the least amount of current necessary to provoke a similar reaction from the opposite or control side. These reactions not only indicated a vital tooth, but sensory regeneration equal in degree to the opposite or non-operated side.

Cases 2, 7, 8, 10, 14, 15, 17 do not necessarily indicate desensitized teeth by the minus sign, but on the other hand a subnormal reaction as compared with the corresponding tooth on the non-operated side which is used as a control or standard of comparison. Many of the teeth indicating the minus sign could be placed on the positive or plus side if an additional degree of current was used, but, on the contrary, the least amount was utilized that was necessary to provoke a response first from the control or opposite teeth. Time no doubt will complete the normal degree of regeneration.

Cases 9 and 24 show inadequate time (2 to 4 weeks) for any degree of nerve regeneration.

Case 18 shows structual change in one tooth.

Twenty-five cases show normal X-ray films, indicating no post-operative structural damage.

While our series of cases are few, they are sufficient in number to prove the Denker or Caldwell-Luc operation is devoid of any permanent damage to the teeth when performed by one who is careful and experienced in technique.

Professional Building.

BLOCKING PUERPERAL SEPSIS.

By STEPHEN HARNSBERGER, M. D., Warrenton, Va.

Modern hospitals claim to be equipped with every preventive aid against the lying-in woman's infection. Hence I cannot imagine how it is possible in such conducted institutions for this sad happening to occur, unless it is that they withhold one item of care; the one item which I have kept in mind and never omit at either full term or premature cases. My views and procedure on all such occasions have been published, but it seems that most physicians are so set in their lecture and text-book knowledge of what to do at and after births that they are not inclined to *treat the patient in hand*. They simply do the bidding of their preceptors and text-books.

"Nothing can justly be despised that cannot be justly blamed: where there is no choice there can be no blame."—*South.*

Why this paper? some may ask. Simply in the interest of the mothers of our children. That, and nothing more.

Cleanliness and submission to the authoritative requirements enumerated and instilled into the minds and hearts of the new graduates and licensed practitioners, leaves no loophole to physicians for individual variation, thought, judgment, discretion or initiative. In fact, it makes the medical man an unconscious automatic machine. He is sworn to this hard and fast rule, and threatened with deterring trouble should he lack or add to this set effort in securing immunity from childbed infections? I put this question mark advisedly, for after many years of observation and maneuvering at the bedside of labor cases, without trained professional or nursing assistance, amidst the worst insanitary surroundings, I am caused to be impressed with the imperative need of every harnessed physician having a "head of his own," and trained to think, suggest, apply and act for himself on his own cognition, as the only qualified, dependable and responsible attendant at child births. Of course this is meant after he has had actual bedside practice for a reasonable period following his graduation and post-graduate training; then he should learn to adapt his efforts to the specific needs of his patient. When he reaches the limit of things taught, he should draw on his own reserve—the latent armamentarium lying dormant within his brain. The reserve is always there, and more or less responsive to enjoined desire or the urgent necessity of the moment. If he has the proper humanistic interest in the welfare of his patient, he will be able to meet the difficulty even in the seemingly hopeless cases; provided he will continue in faith—that is, make interest coincide with duty.

Present-day aseptic measures frequently make the application irksome, as well as displeasing and prohibitive to both patient and nurse, but that need not be taken into account if no other means, less irksome, prove as effective in the prevention of the infections under consideration. Present preventive measures also fall short of constant prevention or of the desired maximum of safety, nor can they come into universal use, being limited mostly to institutional work. What the obstetrician needs is something that can be used at every confinement, whether in the remote sections without trained nurses and those who have no physicians to care for and direct their labors; something the most ignorant and careless midwife or the "drop-in" help can administer; something that can do no harm, but on the contrary can be used to the *lasting* good of the patient and the comfort of fathers and other members of the family. That is what is needed and what state laws should require to be kept on hand and administered to every woman following full-term births and miscarriages. *Better health of mothers is the crying demand of the day.* House help each year grows scarcer and less efficient. The full burden of having children and then caring for them is solely on the mothers. There is no way of shunning it, so it is for physicians, especially the family physician, to earnestly and faithfully care for them at all times that their lives may in some manner be made to accord with humanistic demands. And keep in mind, dear doctor, that your mother wore petticoats. Let that be your guide and inspiration in caring for others. Since the autumn of 1877 it has been my study to make people well, and it is my firm belief at this late date that we should not omit caring for mothers in the way (or a better way if you know it) I have already put in print and will continue to recommend.

From what I can see, it is time for the world to revert to the safe, though blunt, "common sense" manner, rather than to follow the up-to-date, intricate and more costly laboratory method of locating trouble, to insure to the sick and injured their allotted span of life. Laboratory findings, I admit, have a place and

have taught us much of value, but they too often switch us to a wandering track! For instance, the blind acceptance of many of the profession of the heralded wonders done in curing pneumonia by injections of one thing and another is, especially in the great teaching centers, putting too many valuable citizens in the grip of an unending repose. Serums, vaccines, etc., yield a mortality of from thirty to fifty per cent, and in one recent instance in the city of Philadelphia, so the U. S. Public Health Records tell us, let every patient die, 135 cases with 135 deaths in one week. Had those patients been left to open air, plenty of drinking water, little food, lower limbs and body kept warm, with restful repose, they would have fared far better. The longer I live and the greater my observation and experience in handling the sick, the stronger is my faith in the recuperating powers of Nature, provided ill-judged interference ceases to meddle. The sole object of professional service is to assist Nature's weakened metabolic activity and not to try to force her to the point of metabasis. It is my opinion that our business is first to make our patients as comfortable as possible under the circumstances, and next to save life; and making and keeping them comfortable is by long odds the strongest contributing factor in maintaining the vitality, upon which restored health depends.

This paper was suggested by excerpts on puerperal fever from foreign publications in the *Journal of the American Medical Association*, September 20, 1924. Why? We were told years ago that asepsis would surely prevent puerperal infection, and we are told the same today. Yet we find the means and measures universally taught as the surest and only guard against this unfortunate happening are cleanliness from start to finish in caring for puerperal women. This may be the case and it may prove the fortunate outcome in many or a majority of naturally robust women, and a help in many of lesser physical make-up, but it should not be overlooked that the myasthenic (now on the increase) and others with some inactive organic asthenia, say of the procreative organs, cannot be safely left to the futile reclaiming effort of a prevailing local or other lowered physical condition and just cleanliness. Good blood repels infection so long as it is active, but we cannot always tell, even after the most careful tests, the degree of repelling force it carries. Therefore it is the part of wisdom, as well as a sacred obligation of the medical attendant, to anticipate and prevent a contingent which is so frequently followed by lasting harm, or the death of a mother, and a household forced unnecessarily into a state of chaos.

Never curette the parturient uterus. It borders on the criminal. Though it is never well to wait too long in clearing out the placenta and clots, when it has to be done, the hand is the least dangerous expedient. When done early, it is said to prevent possible thrombosis, partially, at least, secure the patient against infection, and protect her from the contingency of embolism. Personally I cannot say, since I have not met with either accident. The danger from manual extraction of the placenta is so slight, and the advantages of its removal so great, that the element of danger never enters my mind.

The invariably successful results following my obstetrical services, backed by the therapeutic measures strictly enforced for at least six weeks, and longer, when I can persuade the patient to continue it, have withstood infection, warded off uterine abnormalities, and will, I feel confident, do much in preventing cancer in later life. Why? Because the puerperal route is put into such a perfect condition of repair that no foci of injury are left to be continuously irritated, the supposed cause of the incident of cancer.

Notwithstanding the fact that I have had to attend labor cases with all manner of infections, I have never had puerperal fever to result from the gross negligence, or rather from the gross necessity, that was forced upon me. A potent preparation of fluid extract of purpurea claviceps is about as perfect as insurance against puerperal infection as the fact of never having had a baby. Get a reliable make, because in administering the drug in non-puerperal conditions, the boggy uterus, etc., I have had the potent makes do what I wanted done. I could not always get the preferred article and on other makes the patients would complain that "the last" medicine was not acting properly. I could not persuade them to feel otherwise, even when I insisted that it was the same as the preparation first prescribed in appearance, taste, color, odor, etc. As soon as I placed them on the make first given, they would invariably say, "We are doing nicely again—the drops are acting properly." Every obstetrical patient should be given a moderate

dose of fluid extract of purpurea claviceps as soon as the after-birth is removed and have it kept up in doses just large enough to give the woman slight abdominal inconvenience, or some slight drawing-up or gripping sensation in the womb, which never disturbs her comfort, and, in fact, adds to it. Relaxed tissues absorb, and contracted tissues repel infection. It's easy to block, just bar the door. My blocking and postural method have filled the requirements. The lying-in woman should always use the chamber, as the upright position drains the uterus and vagina of all waste. It is the only reliable cleansing procedure. Try this "blocking and postural" method—*save the mothers.*

CASE.

Years ago, when I was remote from surgeons, a New York woman arrived in my neighborhood. I saw her an hour after her arrival and found her in labor. She told me her first pregnancy was cut short at five months in a New York hospital, as she could not give birth to a full-term baby. I asked why she deliberately came to a place where no help was at hand. She replied, "she wanted to come and she usually did as she pleased." There were no telephones in that day, and though I wired every town I could reach by telegraph, I could get no assistance. With the bad roads and no trains to any hospital point, it was up to me to do what I could. That one thing was to cut the fetus up and remove it in the piecemeal fashion. My only instruments consisted of a barlow knife and a pair of shoemaker's pincers. My wife aided in giving chloroform. It took four hours. The patient came out admirably—never showing rise of temperature.

Twelve months later, she came in the same condition. The baby was smaller and though labor was slow and rather severe, the infant lived. This case made three operated on with that highly prized barlow knife. It remains under key, but I pray not for further use in labors, as we are now blessed with good roads, telephones, telegraphs, the get-there Fords and doctors to waste. In neither case could forceps succeed and I feared to try opening the abdomen. (Parke, Davis and Co.'s Purpurea Claviceps prevented fever and made the repairs! It has always been successful).

Proceedings of Societies

The Southside Virginia Medical Association

Held its regular meeing in Petersburg, December 9, Dr. George H. Reese, of that city, presiding. A banquet was held at the Petersburg Country Club in the evening. The following officers were elected for 1925: President, Dr. H. M. Snead, South Hill; vice-presidents, Dr. R. H. Manson, McKenney; Dr. F. C. Rinker, Norfolk; Dr. Wright Clarkson, Petersburg; and Dr. J. A. Grizzard, Drewryville; secretary-treasurer, Dr. R. L. Raiford (re-elected), Sedley. It was decided to hold the next meeting in Norfolk in March, 1925.

The Richmord Academy of Medicine,

At its annual meeting held December 9, elected Dr. C. C. Coleman president, and Dr. Warren T. Vaughan and Dr. Arthur S. Brinkley vice-presidents. Dr. M. W. Peyser continues as secretary-treasurer.

At this meeting, the Academy amended its constitution by eliminating Hanover County from the territory of its membership, thus paving the way for granting a charter by the Medical Society of Virginia to the medical society of that county.

An invitation was extended to the Medical Society of Virginia to hold its 1925 meeting in Richmond, with the suggestion, however, that it should not be during the time of the State Fair on account of the housing difficulty.

The Danville Academy of Medicine

Met December 9, at the Golf Club. Dr. Richard W. Fowlkes, of Richmond, by invitation read a paper on "The Treatment of Acne Vulgaris."

Dr. E. H. Miller was elected president of the Academy for 1925; Dr. P. W. Miles, vice-president; Dr. J. A. Tyree, secretary-treasurer.

The Seaboard Medical Association of Virginia and North Carolina

Held its twenty-ninth annual meeting at Rocky Mount, N. C., December 2, 3 and 4, under the presidency of Dr. William E. Warren, of Williamston, N. C. The attendance was large, and the scientific program and social functions were most attractive and thoroughly enjoyed. Dr. R. L. Payne, Norfolk, Va., was elected president for the ensuing year. Vice-presidents are Dr. George A. Caton, New Bern, N. C., Dr. D. Lee Harrell, Suffolk, Va., Dr. M. I. Flemming, Rocky Mount, N. C., and Dr.

XUM

R. M. Cox, Portsmouth, Va. Dr. George A. Caton, New Bern, N. C. was re-elected treasurer, and Dr. Clarence Porter Jones, Newport News, Va., was re-elected secretary. The next meeting is to be held in Norfolk, Va., in December, 1925.

The Richmond Society of Ophthalmology and Oto-Laryngology

Held its regular meeting December 16, 1924, Dr. Karl Blackwell, presiding.

Election of officers for the ensuing year resulted as follows: Dr. Emory Hill, president; Dr. Emanuel U. Wallerstein, vice-president; Dr. F. H. Lee, secretary-treasurer.

The regular scientific program was dispensed with and the time was devoted to business and the report of cases.

Dr. E. T. Gatewood reported a case of fulminating mastoiditis with lateral sinus thrombosis, in which there was absence of aural discharge and of other symptoms indicative of an inflammatory process of the middle ear. Smear and culture showed the hemolytic streptococcus to be the responsible organism.

Dr. R. E. Mitchell reported a case of mastoiditis with operation. The sinus was uncovered and presented protective granulations; four days later the patient developed lateral sinus thrombosis. The internal jugular vein was resected, the sinus opened and the clot in the jugular bulb was removed. Bichloride of mercury was used intravenously with seeming efficacy.

Dr. J. A. White reported several interesting cases—two of cataract extraction, and one of glaucoma following iridectomy preliminary to cataract extraction. Full accounts of these will appear in a later issue of this journal.

W. L. Mason,
Secretary.

The Truth About Medicine

In addition to the articles enumerated in our letter of October 28th, the following have been accepted:

Hoffmann-LaRoche Chemical Works
- Secacornin
- Thigenol

Intarvin Co., Inc.
- Intarvin

Eli Lilly and Co.
- Ampules Ouabain, 0.0005 Gm. (1/128 grain)—Lilly
- Hypodermic Tablets Strophanthin 1/100 grain—Lilly
- Hypodermic Tablets Strophanthin 1/120 grain—Lilly
- Iletin (Insulin-Lilly) U-80

Merck and Co.
- Benzyl Succinate—Merck

Parke, Davis and Co.
- Ampoules Adrenalin Chloride Solution Rx 1, 1:10000, 1 Cc.
- Ampoules Adrenalin Chloride Solution Rx 2, 1:2600, 1 Cc.
- Ampoules Adrenalin Chloride Solution 1:1000, 1 Cc.

Sharp and Dohme
- Hypodermic Tablets Strophanthin (1/200 grain) S. and D.
- Ergotole
  - Ampules Ergot, 1 Cc.

E. R. Squibb and Sons
- Insulin—Squibb, 10 Units
- Insulin—Squibb, 20 Units

Swan-Myers Co.
- Sterile Ampoules Mercuric Potassium Iodide, 0.017 Gm., (¼ grain)—Swan-Myers

Synthetic Drug Co., Inc.
- Compressible Capsules Mercury Salicylate "Synthetic" 1 grain for Intramuscular Injection
- Compressible Capsules Mercury Salicylate "Synthetic" 1½ grains for Intramuscular Injection
- Compressible Capsules Mercury Salicylate "Synthetic" 2 grains for Intramuscular Injection

Winthrop Chemical Co.
- Novasurol
  - Novasurol Ampules

NEW AND NONOFFICIAL REMEDIES

Schick Test-Lederle (New and Nonofficial Remedies, 1924, p. 335).—A diphtheria immunity test, also marketed in packages of one vial containing diphtheria toxin sufficient for 50 tests; in packages of one vial containing diphtheria toxin sufficient for 100 tests. Lederle Antitoxin Laboratories, New York.

Antidysenteric Serum—P. D. and Co. (New and Nonofficial Remedies, 1924, p. 301).—An antidysenteric serum, also marketed in packages of one syringe containing 20 c.c. Parke, Davis and Co., Detroit.

Barbital—Merck.—A brand of barbital—N. N. R. (New and Nonofficial Remedies, 1924, p. 62). Merck and Co., New York.

Barbital Sodium—Merck.—A brand of barbital sodium—N. N. R. (New and Nonofficial Remedies, 1924, p. 63). Merck and Co., New York.

Carbon Tetrachloride—Merck Highest Purity "C. P."—A brand of carbon tetrachloride medicinal—N. N. R. (New and Nonofficial Remedies, 1924, p. 84). Merck and Co., New York.

Cargentos Ointment, 5 Per Cent.—An ointment composed of cargentos (formerly marketed as cargentos new process, New and Nonofficial Remedies, 1924, p. 343), 1 part; anhydrous woolfat 19 parts. The H. K. Mulford Co., Philadelphia.

Cargentos Capsules, 3 grains.—Capsules, each containing cargentos (formerly marketed as cargentos new process, (New and Nonofficial Remedies, 1924, p. 343), 3 grains. The H. K. Mulford Co., Philadelphia.

Diphtheria Toxin-Antitoxin Mixture New Formula (Park Banzhaf's, O.1 L+ Dose).—A diphtheria toxin-antitoxin mixture (New and Nonofficial Remedies, 1924, p. 298), each c.c. of which constitutes a single dose, and contains 0.1 lethal dose of toxin properly neutralized with the necessary amount of diphtheria antitoxin; marketed in packages of three 1 c.c. vials representing one immunizing dose; in packages of thirty 1 c.c. vials representing ten treatments; also in packages of one 30 c.c. vial representing three treatments of three doses each. The H. K. Mulford

Co., Philadelphia. (Journal A. M. A., Nov. 1, 1924, p. 1431).

Nutrivoid flour.—A vegetable product composed chiefly of unassimilable carbohydrates (mannans). It contains fat, 0.92 per cent; protein, 4.31 per cent; nonutilizable carbohydrates, 85.37 per cent. Nutrivoid flour is used as a means of filling out restricted diets, as in the Allen treatment of diabetes. It is a nonnutritive food substance used to give bulk to foods, thus serving to satisfy hunger without furnishing nourishment. Nutrivoid Diabetic Flour Co., New York.

Insulin—Squibb.—A brand of insulin (New and Nonofficial Remedies, 1924, p. 149). It is supplied as insulin—Squibb 10 units (5 c.c. vials containing 10 units in each c.c.), and insulin—Squibb 20 units (5 c.c. vials containing 20 units in each c.c.) E. R. Squibb and Sons, New York. (Journal A. M. A., Nov. 8, 1924, p. 1509).

Lacto-Dextrin.—A mixture composed of lactose, 73 per cent; dextrin, 25 per cent, and desiccated lemon juice, 2 per cent. The administration of lacto-dextrin is proposed as a means of promoting the growth of the normally present aciduric organisms B. acidophilus and B. bifidus in the alimentary tract, so as to make them the predominating organisms. It is claimed that this increased growth of acidophile organisms prevents the undue development of putrefactive bacteria and their products. It is claimed that this change in the character of the intestinal flora brings about increased intestinal activity and that this in turn prevents or ameliorates certain conditions commonly ascribed to putrefactive products in the colon. Battle Creek Food Co., Battle Creek, Mich.

Pituitary Extract—Lilly (Obstetrical).—A slightly acid aqueous solution containing the water soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle. It is tested for oxytocic action on the isolated uterus of the virgin guinea-pig against a standard solution prepared from defatted desiccated posterior lobe powder and adjusted so that its strength is equal to that of a 5 per cent solution of the fresh posterior lobe of the pituitary gland. For a discussion of the actions and uses, see general article, Pituitary Gland, New and Nonofficial Remedies, 1924, p. 225. Pituitary extract—Lilly (obstetrical) is marketed in ampules containing 0.5 c.c. and 1 c.c., respectively. Eli Lilly and Co., Indianapolis.

Pituitary Extract—Lilly (Surgical).—A slightly acid aqueous solution containing the water soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle. It is tested for its pressor action on the blood pressure of mammals and for oxytocic action on the isolated uterus of the virgin guinea-pig against a standard solution prepared from defatted desiccated posterior lobe powder and adjusted so that its strength is equivalent to that of a 10 per cent solution of the fresh posterior portion of the pituitary gland. For a discussion of the actions and uses, see general article, Pituitary Gland, New and Nonofficial Remedies, 1924, p. 225. Pituitary extract—Lilly (surgical) is marketed in ampules containing 1 c.c. Eli Lilly and Co., Indianapolis.

Culture Bacillus Acidophilus—Medical Laboratories, Inc.—A broth culture of **Bacillus** acidophilus in bottles containing about 120 c.c. It contains from 250 to 500 million of viable organisms (**B. acidophilus**) per c.c. at the time of sale. For a discussion of the actions and uses, see Lactic Acid-Producing Organisms and Preparations (New and Nonofficial Remedies, 1924, p. 169). Medical Laboratories, Inc., New York. (Journal A. M. A., Nov. 15, 1924, p. 1589).

Intarvin.—An artificial fat made from fatty acids having an odd number of carbon atoms. Intarvin is composed of the glyceryl esters of margaric acid admixed with small quantities of the glyceryl esters of pentadecylic, palmitic and stearic acids 82 per cent; liquid petrolatum, 12 per cent; water, 6 per cent. Intarvin is proposed for use in diabetes mellitus on the ground that fatty acids containing an odd number of carbon atoms do not yield ketone bodies on oxidation in the normal or diabetic organism, and that for this reason it may with advantage replace the natural fats in the diet. The evidence indicates that intarvin does not increase the production and may reduce the production of ketones in certain cases; that it has protein sparing-action; that sugar is formed from it in small amounts only; that it has little if any beneficial effect on carbohydrate metabolism in the human organism; that its unpalatable taste is a drawback to its use, and that it may prove useful in the treatment of diabetes in certain cases. Intarvin Co., Inc., Long Island City, N. Y.

Quinine Ethyl Carbonate—P. W. R.—A brand of quinine ethyl carbonate—N. N. R. (see New and Nonofficial Remedies, 1924, p. 267). Powers, Weightman-Rosengarten Co., Philadelphia. (Journal A. M. A,. Nov. 22, 1924 p. 1685).

Secacornin.—Ergotin-Roche.—A solution of the active principles of ergot in a menstruum consisting of distilled water, glycerin and 7.5 per cent of alcohol. One cubic centimeter secacornin corresponds to 4 Gm. ergot, U. S. P. The actions and uses of secacornin are the same as those of ergot. It may be given by intramuscular injection. Hoffman-LaRoche Chemical Works, New York. (Journal A. M. A., Nov. 29, 1924, p. 1769).

PROPAGANDA FOR REFORM

Aolan Not Accepted For N. N. R.—The Council on Pharmacy and Chemistry reports that Aolan is prepared from milk freed from fat and is claimed to be a germ-free and toxin-free solution of lactalbumen, manufactured in Germany for the H. A. Metz Laboratories, Inc. The use of Aolan is recommended by intramuscular and intravenous injection in a large number of conditions. The Council found Aolan inadmissible to New and Nonofficial Remedies because it is marketed under unwarranted therapeutic claims. When the Metz Laboratories was informed of the Council's decision, the firm sent a detailed reply. After considering this reply, the Council decided that the rejection of Aolan should stand. The Metz Laboratories, Inc., does not hold itself responsible for the many and varied claims made for nonspecific protein therapy and the uses of Aolan in connection therewith which have appeared in print. Although the claims advanced by the American agent are relatively moderate, they are still unacceptable because they are unsupported by controlled clinical evidence from reputable observers. (Journal A. M. A., Nov. 8, 1924, p. 1526).

Pollantin Not Accepted For N. N. R.—Pollantin Liquid, Pollantin Ointment and Pollantin Powder are hay-fever "remedies," manufactured in Germany and marketed in this country by Fritzsche Bros., Inc., New York. According to the advertising, it is prepared from the serum of horses inoculated with "the pollens of various species of ragweed and goldenrod, and of graminae, such as rye, Indian corn, meadow foxtail, timothy grass, etc.," and is suitable for all forms of hay-fever. An enormous amount of work has been published controverting the claimed value of this serum. The principle on which Pollantin was founded has been found to be unsound, and there is no acceptable evidence to show that hay-fever is due to a toxin in pollen. The Council on Pharmacy and Chemistry found Pollantin Liquid, Pollantin Ointment and Pollantin Powder inad-

XUM

missible to New and Nonofficial Remedies because the claims for their value are unfounded and they appear to be unscientific and useless articles. (Journal A. M. A., Nov. 8, 1924, p. 1526).

Cleero.—This is labeled "the vanishing shampoo." It is another piece of cosmetic quackery put out by the Van Ess Laboratories, Chicago. Cleero is sold with the claim that the use of soap on the hair is dangerous and that "the free alkali present in most soaps" makes them still worse. The A. M. A. Chemical Laboratory analyzed Cleero and found it to be essentially a perfumed watery solution of soap with free alkali and glycerin. (Journal A. M. A., Nov. 15, 1924, p. 1607).

Hexamethylenamin.—Like the earlier attempts to "disinfect" the alimentary tract through ingestion of selective germicidal substances, the efforts to render the entire organism free from microorganism by a similar therapeutic procedure have not been attended with conspicuous success. Hexamethylenamin was early hailed to promising success in these endeavors. It has been recommended as an antiseptic agent for virtually all the body fluids. It was soon demonstrated, however, that bacterial growth is not prevented by it, even in proportions much higher than could be found anywhere in the body. This important evidence rendered it improbable that the administration of hexamethylenamin can exert marked antiseptic effects in the tissues. In an acid solution hexamethylenamin disintegrates into ammonia and formaldehyd, and to the latter substance are doubtless due the beneficial therapeutic results experienced in the treatment of urinary infection. A recent study demonstrates that the alleged beneficial effects of hexamethylenamin systemically in various infectious diseases cannot be explained by the presence of adequate liberation of formaldehyd in the circulation and tissues. The drug itself is not antiseptic; and the hope of securing systemic antisepsis through its use seems forlorn. Its one field of action seems to be in pathologic conditions in the urinary tract, and it is necessary that the urine be markedly acid. (Journal A. M. A., Nov. 23, 1924, p. 1688).

San-Gri-Na.—"San-Gri-Na is the formula of a French physician. It has been used in Europe by millionaries, actresses and hundreds of fat men and women because it is simple, easy, pleasant and harmless." Thus runs part of the advertising claptrap for San-Gri-Na, one of the recent entrants to the "obesity cure" field. The preparation is put out by the "Scientific Research Laboratories," New York City. The newspaper advertisements convey to the obese public the idea that it is unnecessary to exercise or diet, the only desideratum being the purchase of San-Gri-Na. When the stuff has been bought, however, the purchaser finds that in addition to San-Gri-Na she should take the juice of one lemon in a glass of warm water every morning, chew her food very thoroughly, eat only two or three light meals a day, sleep not more than six or seven hours, do a reasonable amount of walking, take no liquid with meals, avoid starches, fat and candy. From the analysis of San-Gri-Na in the A. M. A. Chemical Laboratory, it appears that the product consists of tablets containing sulphur and cream of tartar with a small quantity of phenolphthalein as their essential constituents. (Journal A. M. A., Nov. 22, 1924, p. 1703).

Pixalbol Not Accepted For N. N. R.—The Council on Pharmacy and Chemistry reports that Pixalbol is the name under which E. Bilhuber, Inc., New York, markets a colorless tar preparation which is manufactured by Knoll and Co., Ludwigshafen a. Rh. Germany. It is claimed to be identical with the preparaton formerly sold in the United States by Knoll and Co. as Anthrasol. The trademark on the word "Anthrasol" was seized by the United States government during the late war and sold to the Chemical Foundation, Inc. The product may be marketed in the United States under the name Anthrasol only with the consent of the holders of the rights to the trademark. In consideration of the abuses which are connected with the application of proprietary names to medicinal articles, the Council recognizes such names only when this is in the interest of the public welfare. Since the product in question was introduced under the name Antrasol, the Council decided that it was not in the interest of medicine that further proprietary names be applied to it. The Council informed E. Bilhuber, Inc., that consideration will be given the product if it is marketed as Anthrasol under license from the Chemical Foundation, Inc., or under a satisfactory descriptive nonexclusive name. (Journal A. M. A., Nov. 22, 1924, p. 1704).

Peptone Solution for Hypodermatic Use (Armour) Not Accepted For N. N. R.—Peptone solution for hypodermatic use is marketed by Armour and Company in ampules containing 1 c.c. of a 5 per cent solution of Armour's Special Beef Peptone. The product is advertised "as an aid in immunization, hypodermatically and orally" and the advertising refers in the main to the firm's peptone solution for hypodermatic injection, although its intravenous use is also dealt with. Emphasis is given to the use of peptone in the treatment of asthma. Reference is also made to its use in such conditions as hay-fever, skin affections associated with asthma, cyclic gastro-intestinal attacks, urticaria, coryza of the spasmodic type, migraine angioneurotic edema and pruritus. Intravenous medication—some wise and some foolish—has greatly increased in recent years, and it is not suprising that foreign proteins should be used in the hope of accomplishing something in conditions such as those for which the Armour preparation is advertised. It is a serious question whether the best interests of medicine are served by the recognition of methods, the real value of which is not established, the limitations and dangers of which are not understood, and the general employment of which contributes to the profits of those who sell the product, rather than to a knowledge of the actual value of the product. For this reason, the Council on Pharmacy and Chemistry voted not to accept Peptone Solution for Hypodermatic Use (Armour) because it is an unstandardized mixture, and because its acceptance would be taken as an endorsement of the use of peptone for intravenous use, presumably for all the conditions in which its employment has been recorded. The Council wishes it understood that, in not accepting this preparation, it has no intention of opposing the legitimate use of protein preparations by those who wish to study nonspecific protein therapy. The Council reports that Armour and Company appeared willing to undertake the standardization of the protein, but that the rejection of the preparation was affirmed because its value has not been established. (Journal A. M. A., Nov. 29, 1924, p. 1786).

Whichever way the wind doth blow,
Some heart is glad to have it so;
So blow it east, or blow it west;
The way it blows, that way is best.

—*Selected.*

Virginia Medical Monthly

FOUNDED BY LANDON B. EDWARDS, M. D., APRIL, 1874.
OWNED BY THE MEDICAL SOCIETY OF VIRGINIA.
PUBLISHED BY THE PUBLISHING COMMITTEE.

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All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

Subscription Price: $2.00 per annum in advance.
Single Copies 20c.

Vol. 51. JANUARY, 1925 No. 10

Editorial

John Nottingham Upshur, M. D.

Born at Norfolk, Virginia, February 14th, 1848; Died at Richmond, Virginia, December 10th, 1924.

John N. Upshur, descendant of a long American ancestry, completed his academic education at the Virginia Military Institute; he acquired his medical education and received his medical degree from the Medical College of Virginia, in 1868; he practiced his profession in Richmond from the time of his graduation to the time of his last illness, a practice covering a period of more than a half century. Dr. Upshur was a Charter Member of the Medical Society of Virginia (1870); he was President of the Medical Society of Virginia in 1902-3. He was a member of the Richmond Academy of Medicine and Surgery, and its Preisdent for a term. In the Medical College of Virginia he occupied various chairs in its faculty: Professor of Materia Medica and Therapeutics from 1884 to 1894; Professor of Practice of Medicine from 1894 to 1899; Emeritus Professor of Practice of Medicine to the time of his death.

Dr. Upshur participated in and exerted a great influence in various medical and professional organizations, being an active member of city, state and national societites. He contributed many clinical papers to these meetings through the years and entered into discussion of medical subjects presented with readiness and effect. His lively interest in and enthusiasm for clinical medicine enabled him to be ever ready and able to defend or champion an opinion, a cause, or a conclusion.

For fifty-six years Dr. Upshur pursued the duties of his professional calling here in the city of Richmond. During that long period he held a foremost rank as a medical practitioner, serving with great skill a long roll of patients. For years he enjoyed a large consulting practice. His ability and skill in diagnosis and therapy were recognized by the profession. Frequent calls in consultation were made upon him by his colleagues in order to obtain the benefit of his wide experience in clinical medicine.

Dr. Upshur was, likewise, an eminent teacher for years in the faculty of the Medical College of Virginia. He will be remembered by many active practitioners of today because of his vivid, lucid, impressive and didactic lectures and clinical discourses in medicine between the years 1884 and 1899. As a teacher he deeply impressed the student. Enthusiastic and earnest, he inspired the student with interest and engaged his intellectual co-operation. Of clear voice and fluent tongue, his didactic discussions of favorite medical themes made lasting impression. His career as a teacher was no less distinguished than that as a practitioner and clinician. His memory will ever be fresh in the minds of his former students at the Medical College of Virginia.

In his professional life the highest ethical characteristics were found. Only in the realm of high professional dealing he was always found. He was ever the champion and the exemplar of high ethical standards, both in private and public professional relations. No man was able to question his integrity and his lofty purpose in professional manners. Likewise in scientific procedure, he did his best. A product of the medical education of a rather distant era, he kept well in hand the sane and safe medical and surgical advances of the day. He sometimes appeared to express some disapproval when advanced ideas were not to his mind worthy. In late days he was bold to express disapproval of trends and drifts that appeared to lead to evils in practice. If reactionary, it was not for want of scientific interest, but for fear of the untoward and harmful effects of the newer claims. In no way did he obstruct progress, but rather was quick to entertain and practice accepted scientific discoveries.

Dr. Upshur's American ancestry reached

with a well-defined lineal course through American colonial times. His forefathers were foremost Americans. His ancestry was distinctly English. His immigrant ancestor came to America in 1642. He settled in Accomack County, Virginia. This immigrant Upshur came from Essex, England, representing a line of high type Englishman traceable for centuries in English history.

In the personal bearing of our distinguished and lamented Dr. Upshur, the breeding and culture of centuries might easily be seen. His upstanding, clear-cut, straight-forward, gentlemanly presence bespoke the generations of honorable American ancestry. His personal characteristics, furthermore, gave expression to the same American influence of the best sort. Born of Virginia's best people, he was a splendid example of Virginian-modern manhood. Pure in his life, he lived for generations in Richmond as an honored example of a Christian gentleman. He was held in high regard not only for his professional knowledge, but also for his unfailing devotion to the highest principles of life and service. He was recognized by all who knew him to be not only a follower of high moral standards, but also a valiant defender of righteousness in public and private life. This characteristic of the man stood out pre-eminently. He was ever ready to defend and champion the right as he saw it. His defense of his cause was virile and telling. There was never any uncertainty as to where Dr. John N. Upshur stood on moral questions. He was uniformly found in ranks of contenders for the best ethical standards. He was definitely clear in his mental processes. He was ever ready to champion with avidity the causes of spiritual and religious life. He was an ardent, consistent and faithful churchman. For more than fifty years, he held high and responsible positions in the church. His professional work and his church were coordinate. The same characteristic personal traits were found in his religious life as were true of him in professional life. He was true: he was faithful. He lived constantly a Christian gentleman through the years.

Some of his predecessors in the profession have held as high place in point of reputation and success, but none have excelled our lamented nestor in medicine in Richmond in that finer and higher spiritual life which represents the best type of manhood found in the race. His life was a well spent one. He served with fidelity for more than a half century a vast number of sick and distressed people. He gave them every service cheerfully, faithfully and with skill. He did not spare himself. He sacrificed his comfort and health in his professional work. He did not falter or fear, but worked laboriously for the sick. He taught his art to others. He was a successful teacher. He was strong and influential in medical societies and organizations. He wrote on medical subjects.

He served his country in war and all but gave his life to the Southern cause. He was patriotic and loyal to city, state and country. He was a high bred and high minded man of pure private and public life. He was the friend of the poor and was ever ready to serve them. He was a strong, faithful and consistent churchman. He was a defender of the faith in professional and religious life, and, for himself, with Tennyson, might have said:

Sunset and evening star,
And one clear call for me!
And may there be no moaning of the bar,
When I put out to sea.

But such a tide as moving seems asleep,
Too full for sound and foam,
When that which drew from out the boundless deep
Turns again home.

Twilight and evening bell,
And after that the dark!
And may there be no sadness of farewell,
When I embark.

For tho' from out our bourne of Time and Place
The flood may bear me far,
I hope to see my Pilot face to face
When I have crossed the bar.

Encephalitis

On March 8, 1919, there was announced in the press a report of certain obscure cases which the public health officials of Evanston, Illinois, had pronounced epidemic lethargic encephalitis. The newspapers began immediately to call these cases by the very misleading term of "sleeping sickness." Dr. Ennion Williams appointed a commission to look into the condition in Virginia and on May the 17th, Dr. Tucker, the chairman, reported eleven cases with two autopsies in the *Journal of the American Medical Association*. Since this time medical literature has been flooded with reports of encephalitis cases.

It has been debated whether or not the condition was a sequela of influenza, and although some do not accept this theory and others have thought they had observed an especial organ-

ism, still the consensus of opinion is that it follows influenza or is an expression of influenza *per se*. Past epidemics under various names have been observed following epidemics of la grippe. Many autopsies have been performed, the chief findings of which have been cerebral congestion with minute hemorrhages scattered throughout the brain, cobweb adhesions at the base of the brain and, in the long standing cases, dilated ventricles. The chief clinical findings have been various marked, slight or transient cranial nerve disturbances (including double ptosis), tremors, muscular immobility and at first a slight febrile stage. The course has been very irregular in time, some cases have recovered in a few to many weeks, some die while many go into, or are followed by, complications or sequelae, such as insanity, hemiplegia, spastic states and conditions resembling paralysis agitans.

Since encephalitis has become known in 1919 it has been more or less constantly present. Several points in regard to the disease need emphasis. In the first place these patients are rarely asleep or drowsy, as is commonly supposed, but they have this appearance because of double ptosis, weakened facial muscles and infrequent voluntary change of body position. Again, there is a tendency, at least, toward moderate increased intracranial pressure, and occasional lumbar punctures may prevent the damage that might be done by permanently distended ventricles. In the paralysis agitans form the lesion is in the lenticular nuclei and the pill rolling tremor of true Parkinson's disease is usually replaced by a more or less constant general tremor. Lastly, autogenous serum, inactivated and given intraspinally, appears to be a very valuable therapeutic measure.

B. R T.

News Notes

The Distribution of Physicians in the United States

Is discussed in a report by Lewis Mayers and L. V. Harrison, issued by General Education Board, of New York City. Answers to a large number of questionnaires sent out in representative areas served as the basis of their report. It is conclusively proven that the percentage of physicians in rural districts and small towns was much lower in 1923 than in 1906. The recent graduate's avoidance of rural locations is ascribed largely to the lessened opportunities for making a livelihood in these sections and to his inability to be in touch with the facilities which he has been taught to use when in college and hospital.

In a few places community action in subsidizing a physician has worked well. It is generally conceded, also, that a physician is more likely to have the respect of a community if his services are sought than if he comes to it as a prospector seeking a living. Plans adopted by several communities are cited. A physician accepting a position in a community, on a full or part-time payment basis, should see that adequate arrangement is made for him to take a vacation every year or two for recreation and for the purpose of visiting medical centers and coming in contact with current developments.

The Commission on Cancer,

Of the Medical Society of the State of Pennsylvania, after making a thorough investigation of the cancer problem in that State, recommended that they would co-operate as a Commission and as individuals with the American Society for the Control of Cancer in its "Cancer Week" educational work. The Commission made a survey of the cancer situation in Pennsylvania in 1923 along the same lines and with the same form of questionnaire as in 1910, at which time public education with regard to cancer was undertaken in that State. A comparison of the figures proves most conclusively that CANCER EDUCATION DOES PAY. Inquiries of many patients applying early for treatment brought the response that it was due to hearing a lecture on cancer.

In completing its report, this Commission, of which Dr. J. M. Wainwright, of Scranton, is chairman, urged that a cancer division be added to Pennsylvania State Health Department Clinics, to eliminate the pernicious influence of physicians who do not refer patients for operation in time, and to reach patients in meager circumstances who delay seeing the doctor because of the cost of a proper investigation.

The Southern Surgical Association,

At is annual meeting in Charleston, S. C., December 9-11, 1924, decided to hold its next meeting in Louisville, Ky., in December, 1925, and elected Dr. Irvin Abell, Louisville, Ky., president and Drs. Stephen H. Watts, Uni-

XUM

versity, Va., and Archibald J. Buist, Charleston, S. C., vice-presidents. Dr. Hubert A. Royster, Raleigh, N. C., and Dr. Urban Maes, New Orleans, La., continue as secretary and treasurer, respectively.

The Association of Surgeons of the Seaboard Air Line Railway

Held its annual meeting at Sarasota, Fla., early in December, with a good attendance. Dr. Samuel E. Harman, Columbia, S. C., was elected president, and Dr. J. W. Palmer, Ailey, Ga., was re-elected secretary-treasurer. Dr. W. T. Graham, Richmond, Va., was elected third vice-president. Dr. Jack Halton, Sarasota, Fla., was elected a member of the executive committee for a six-year term. The date and place of meeting for 1925 was left for the executive committee to decide.

Married.

Dr. John Mason Bishop, of Roanoke, Va., and Miss Mary Converse Gilman, of Richmond, December 6.

Dr. John J. Neal and Miss Lillie May Voss, both of Danville, Va., October 11, 1924.

Dr. Allen Barry Sloan, of Charlotte, N. C., and Miss Charlotte Green Francis, Richmond, December 25. Dr. Sloan is a member of the class of '24, Medical College of Virginia. On their return from a Southern trip, they will be at home at 1025 Floyd Avenue, Richmond.

Dr. James D. Clements, of Gloucester, Va., and Miss Alice Teackle Wallis Moore, of Carlisle, Pa., December 20.

Richard Cannon Eley, of Suffolk, Va., a member of the fourth year medical class of the University of Virginia, and Miss Caroline B. Flynn, of Jamaica, L. I., December 27.

Dr. Samuel Palmer Hileman, Catawba Sanatorium, Va., and Miss Ruth Meredith Yerby, Richmond, Va., January 3. Dr. Hileman is an alumnus of the Medical College of Virginia.

The Tri-State Medical Association of the Carolinas ard Virginia

Will have its twenty-seventh annual meeting in Richmond, Va., February 18 and 19, with probably a brief session on the 20. The first meeting will be held in the auditorium of the Jefferson Hotel at 10 A. M., February 18. By resolution adopted at the last meeting, the number of papers on the program will be limited to twenty. An interesting and pleasant time will be enjoyed by those attending. Dr. F. H. McLeod, Florence, S. C., is president, and Dr. James K. Hall, of Westbrook Sanatorium, Richmond, Va., secretary-treasurer.

Dr. Sydney J. Baker

Has returned to his home in Richmond, after several months spent in study in New York City.

The Annual Report of the Chief of the Children's Bureau,

Washington, D. C., shows that many phases of child welfare and practically every state in the Union were touched during the course of the year's work by the Children's Bureau. Scientific investigations into problems affecting childhood were made by the Bureau's divisions of child hygiene, maternity and infancy welfare, social service and its industrial division. Active co-operation with State bureaus and commissions dealing with children was maintained by this bureau.

Hospital Founded by Appalachia Masons.

The Appalachia, Va., Masonic Lodge recently purchased a fourteen-room house in that place which is to be directed by them and known as the Masonic hospital. This institution will be open to every one and will be ready for service at an early date.

Dr. P. G. Hamlin,

Of the Medical Aviation Corps of Long Island, was a recent visitor in Williamsburg, Va., where he was for some time connected with the staff of the Eastern State Hospital.

Two Added to Staff of Evangeline Booth Hospital.

Dr. Warren T. Vaughan will be connected with the medical staff of Evangeline Booth Hospital, Richmond, this year, as diagnostician and consultant, and Dr. Joseph Alexander will supervise dental surgery. In addition to these, the medical staff includes Dr. Robert C. Bryan, director, and Drs. Ben Gray, Clifton M. Miller, Thomas W. Murrell, Garland M. Harwood, and Paul Redd. It is announced that ninety-seven adults and fifty-seven children received treatment at this hospital last year.

Investigation of Scarlet Fever.

Highest susceptibility to scarlet fever exists from the ages of one to two years, according to the results of tests made with 7,700 normal persons of different ages. Results of these tests are summarized by Dr. Abraham Zingher in the *American Journal of Public Health*. Nearly three-fourths of the children between one and two years of age were susceptible, but only 14.4 per cent of those from twenty years up. Dr. Zingher reports that investigations

are being made to discover the results of immunization against scarlet fever and diphtheria in the case of 2,000 children under six years of age. Records of these children, who have been immunized, are being kept for comparison with lists of scarlet fever and diphtheria cases developing during the coming year.

The Church Hill Medical Society,

Of Richmond, Va., at its annual meeting last month, elected the following officers for the ensuing year: President, Dr. G. Chambers Woodson; vice-president, Dr. J. W. Hannabass; secretary and treasurer, Dr. R. S. Faris; reporter, Dr. W. H. Whitmore; librarian, Dr. B. L. Phillips. This society meets twice each month at the homes of members, and following the scientific program, supper is served.

Dr. Armistead C. Crump,

Of New York City, has recently been appointed consulting physician in gastro-intestinal diseases at the Presbyterian Hospital, of that city. Dr. Crump is well known in this section, having made his home in Richmond until after his graduation from the former University College of Medicine of Richmond in 1903.

Duty on Barbital and Barbital-Sodium Based Upon American Valuation.

On November 14, 1923, President Coolidge, following the unanimous recommendations of the U. S. Tariff Commission, proclaimed that "to encourage industries in the United States, and for other purposes," the duty on diethyl-barbituric acid and its salts, known as barbital and barbital-sodium in this country, and which are chemically identical with veronal and veronal-sodium, be computed upon the American instead of the foreign valuation. In view of this, announcement has alrealy been made to the medical profession of a reduction in the price of these drugs.

Dr. Alexander G. Browr, Jr.,

Of Richmond, sailed from New York, December 27, aboard the Olympic, for Europe. He will spend several weeks visiting in Paris and touring through Southern France and Italy, going as far as Rome. After this, he will visit some of the chief European medical clinics, including those in London and Edinburgh.

It is particularly interesting to note that Dr. Brown will visit the University of Edinburgh, as two of his ancestors who were American doctors received their medical education at this institution. Dr. Gustavus Brown graduated at Edinburgh in 1706 and practiced in southern Maryland, and his grandson, Dr. William Brown, who later served as surgeon-general in the American Revolution, also received his medical diploma from this University in 1770. Dr. William Brown practiced his profession in Alexandria, Va.

Increase in Mortality Rate.

Mortality rates in the United States for 1923, just made public, showed a death rate for that year of 12.3 per 1,000 population, as compared with a rate of 11.8 for 1922. There was a decrease in the death rate from tuberculosis and diabetes mellitus and the rate for deaths from typhoid fever was the lowest ever shown in the registration area. However, the cancer rate continues on the increase and in 1923 there was also an increase in the rates from influenza, pneumonia, diseases of the heart, measles, cerebral hemorrhage, whooping cough, automobile accidents, nephritis, railroad accidents, accidental falls, and puerperal causes.

Dr. M. S. Duling,

Who was recently associated with Dr. John P. Haller, at Boissevain, Va., has moved to Charleston, West Virginia, and is now on the staff of the Staats Hospital at that place.

Dr. W. P. Burton has succeeded Dr. Duling at Boissevain.

Dr. S. E. Massey

Announces his removal from Roanoke, Va., to Beech Fork, McDowell County, West Virginia.

Dr. Horace T. Hawkins,

Clover, Va., has been elected worshipful master for 1925 of the Hurt Lodge, No. 26, A. F. and A. M., of Scottsburg, Va. As master of the Lodge, he will represent his Lodge in the sessions of the Grand Lodge, in February.

Dr. and Mrs. B. L. Phillips,

Of Richmond, have been recent visitors at Palmyra, Va.

Drs. A. E. and J. W. Turman,

Richmond, were called to Floyd County, the middle of December, by the illness and death of their father.

Memorial Tablet to Dr. Newton Unveiled.

A bronze tablet, in memory of Dr. McGuire Newton, of Richmond, was unveiled at the Children's Memorial Clinic of this city, on the

XUM

afternoon of December 23, with appropriate exercises. The tablet was purchased with contributions made by former patients of Dr. Newton.

Change in Distribution of Sofie A. Nordoff-Jung Cancer Prize.

The commission for the distribution of the prize for cancer study, founded by Doctor Sofie A. Nordoff-Jung, in agreement with the foundress, has resolved to distribute the prize from now on only every two years, to the double amount of the sum allotted heretofore, that is one thousand ($1,000) dollars. The next prize will reach distribution in 1926.

Dr. John A. Gibson

Has returned to his home in Leesburg, Va., after a visit to relatives in Georgetown, South Carolina.

Dr. and Mrs. Julian F. Ward,

Winchester, Va., are home again after a visit to friends in Baltimore, Md.

Dr. and Mrs. J. Fulton Williams,

Charlottesville, Va., recently enjoyed a vacation at Waynesboro, Va.

Dr. A. W. Terrell,

Lynchburg, Va., has been elected a member of the board of directors of the Guarantee Title and Bond Company, which has been formed in that city, under a Virginia charter, for the purpose of insuring titles to real estate, making loans on improved realty, etc.

Dr. Northington Succeeds Dr. Townsend as Editor.

With the December issue of *Southern Medicine and Surgery*, published at Charlotte, N. C., Dr. James M. Northington took over the editorship of this publication. He succeeds Dr. Maurice L. Townsend, who has ably conducted this journal since the death of Dr. E. C. Register, several years ago. Dr. Townsend has accepted an appointment on the N. C. State Board of Health to direct its educational work.

Mr. Aubrey H. Straus,

Director of Laboratories for the State Board of Health, and the Richmond Health Bureau, has been granted a five months' leave of absence. Mr. Straus left January 1st for Baltimore, where he intends to undertake special studies in the Johns Hopkins School of Hygiene and Public Health.

Dr. I. C. Riggin, State Epidemiologist, has been appointed Acting Director of Laboratories during his absence. Miss Adah Corpening will continue in her present capacity of Assistant Director of the Laboratory.

Drs. E. H. Claud and L. A. McAlpine

Have returned to their homes in Portsmouth, Va., after spending a short time in Boydton, Va.

Annual Report of Surgeon General, U. S. Navy.

This last annual report shows that the professional work of the Medical Department has been of the high standard mentioned in previous reports. The naval hospitals are in excellent condition and the equipment is adequate and the personnel professionally alert. The bureau has continued its educational policy, and post-graduate instruction of members of the Medical Department who have displayed efficiency in their calling has been carried on systematically. During the fiscal year, fifty-two medical officers were lost by resignations, etc., and seventy-eight medical officers appointed.

This report shows that less sickness and resulting disability were experienced than in most recent years. Communicable diseases caused comparatively little interference with the work of the Navy, if venereal diseases be excepted. There was a slight increase in the death rate for 1923 over 1922, which was due almost entirely to the fact that twenty-three men were drowned when two destroyers were wrecked and that there were twenty-four deaths caused by measles in comparison with one the year before, which was not a measles year.

Dr. and Mrs. J. C. Flippin,

University, Va., spent the holidays in Danville, Va.

Dr. Robert Whitehead,

Meherrin, Va., spent the Christmas vacation at the home of his parents, in Amherst, Va.

Winchester Hospital Seeks to Change Charter.

Directors of the Winchester, Va., Memorial Hospital, have petitioned the State Corporation Commission to amend the hospital's charter so that it will be enabled to accept and apply certain specific benefactions, which it could not do under its original charter. This hospital is now planning also to raise approximately $40,000 for a new central heating plant and the enlargement of the nurses' home. This last improvement is necessary, as the hospital plans to take on additional nurses to comply

with the standards required by the American College of Surgeons.

"Sunshine" Clinic, England.

Hull, England, is reported the first city to establish a clinic for the treatment of babies and children by artificially produced light rays having the curative qualities of direct sunlight. Malnutrition and rickets have been treated with marked success, it is said.

Tryparsamide Available.

The Rockefeller Institute for Medical Research has announced the release of the drug known as Tryparsamide for use in the treatment of human and animal trypanosomiasis (African sleeping sickness and *mal de caderas*) and selected cases of syphilis of the central nervous system. This action is based on results reported from clinical investigations which have been in progress for several years. The drug will be manufactured by the Powers-Weightman-Rosengarten Co., of Philadelphia, and will become available through the regular trade channels about January 1, 1925. In releasing the drug for the benefit of the public, the Rockefeller Institute desires it to be known that the Institute does not share in any way in profits that may be derived from the sale of the drug and that, with the cordial cooperation of the manufacturers, provision has been made for the maintenance of a schedule of prices on as low a basis as possible.

Dr. John R. Atwell

Has returned to his home at Wicomico Church, Va., after undergoing an operation in a Baltimore hospital.

Memorial Tablet to Dr. Johnston.

A bronze tablet in memory Dr. George Ben Johston was presented Johnston-Willis Sanatorium, Richmond, on December 20, by a group of prominent local physicians. Dr. Murat Willis, who was associated with Dr. Johnston for a number of years and with him founded the hospital, presided at the presentation exercises. Ex-Governor Henry C. Stuart was the principal speaker; Dr. W. K. McCoy, Gum Spring, Va., made the presentation, and Mr. Eppa Hunton, Jr., received the tablet on behalf of the hospital. The inscription is as follows: "To the memory of George Ben Johnston, M. D., L.L.D.: a lover of the poor; a friend of the physician; an eminent teacher, and a master surgeon; 1852-1916." It was placed on the west wall of the hospital lobby.

The Annual Report of the Surgeon General of the Public Health Service,

For the fiscal year ended June 30, 1924, would indicate that this Service is keeping up its good health work, although the general death rate for 1923 was slightly higher than for 1922, in twenty-five of the thirty-six states for which data are available. There were reported 30,771 cases of smallpox in forty-five states, which shows that this disease is much more prevalent in the United States than in European countries. Approximately one-fifth of all cases of smallpox reported occurred in the United States, which Surgeon General Cumming states is due to neglect of vaccination, re-vaccination, and in part to organized opposition to this most efficacious measure.

One of the many interesting facts brought out in this report was the increase in the length of human life. This in the sixteenth century was estimated to be between eighteen and twenty years; at the close of the eighteenth century, it was less than 25 years, and, as late as 1900, it was only between forty-five and forty-eight years. The present average length of life in the United States is estimated at fifty-six years, and approximately fifteen of these years have been added to our span of life in this country since 1870.

Dr. and Mrs. Frank P. Smart

And children, of Norfolk, Va., spent the Christmas holidays at Crozet, Va.

The Loudoun Hospital,

At Leesburg, Va., has been presented with $1,500, part of which will be used for the endowment of a bed and the balance for philanthropic purposes.

Dr. Randolph Honored.

Dr. Buckner M. Randolph, Washington, D. C., an alumnus of the Medical College of Virginia in the class of '98, has been presented with the cross of the French Legion of Honor by Ambassador Jusserand at the French Embassy in Washington. This was given in recognition of Dr. Randolph's services for thirteen years as physician to the embassy in Washington. He also examined many French soldiers called to arms when war was declared in 1914.

Hospital Destroyed by Fire.

The Civic League Hospital, at Jackson, Tenn., on December 9th was destroyed by fire which originated near the roof of the building. Eighteen patients were in the building at the time and all were removed to safety.

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Dr. and Mrs. M. R. Faville

And daughters, of Roanoke, Va., spent the holiday season with friends at University, Va.

Doctors on Hospitalization Committee, American Legion.

Dr. Israel Brown, Norfolk, is the chairman of the Virginia American Legion hospitalization committee, appointed the middle of December. Other doctors on this committee are Dr. Jack Witten, North Tazewell; Dr. Hugh T. Nelson, Charlottesville; Dr. R. C. Fravel, Richmond; and Dr. Hugh H. Trout, Roanoke.

Dr. H. F. Hoskins,

Saluda, Va., with several friends, spent sometime in December deer hunting in the mountains of North Carolina.

Dr. A. M. Byrd,

For the past two years associated with Dr. W. R. Williams, at Richlands, Va., has resumed private practice at the same location.

William Holland Wilmer Foundation.

Under the auspices of this Foundation, there is to be established at Johns Hopkins Hospital and Medical School, the Wilmer Ophthalmological Hospital and Clinic for the study and treatment of diseases of the eye. It will have as its director Dr. William H. Wilmer, an alumnus of the University of Virginia, who, for a number of years has been one of the most prominent ophthalmologists in Washington, D. C.

Dr. and Mrs. S. R. Jordan

And little daughter, of Townsville, N. C., are spenling the winter at De Land, Fla.

Major Allen J. Black,

Of the medical corps, U. S. Army, now stationed at Fort Andrews, Mass., in renewing his membership in the Medical Society of Virginia for 1925, writes that "The Monthly is a most welcome visitor always. Besides the enjoyment of the excellent, high grade papers, it brings news of old friends in Virginia."

We hope this will prove an incentive for our readers to send us news items about themselves and their friends, whenever occasion arises.

Dr. and Mrs. John T. R. Sweeney,

Richmond, are receiving congratulations on the arrival of a little daughter on December 23.

Professor Bergonie Dead.

News has been received in this country that Professor J. Bergonie, an outstanding figure in the development of the science of roentgenology, died in France, early in this year. Despite personal suffering, he continued his work until shortly before his death. The French government recently awarded Professor Bergonie the Grand Cross of the Legion of Honor in recognition of his heroic contributions to science.

Dr. E. M. Wilkinson,

Of Clinchfield, Va., has located temporarily at Fremont, Va., pending the resuming of operations of mines at Clinchfield.

Dr. James H. Smith,

Of Richlands, Va., of the class of '04, University College of Medicine, spent the holidays with his family, at Johnson City, Tenn.

Dr. L. M. Abbott,

Who was for a time at Flinn, Va., is now located at Lignite, Va.

Dr. Susan A. Price,

Who has been spending some time at her home in Marlinton, W. Va., is now connected with the medical staff of Eastern State Hospital, at Williamsburg, Va.

Dr. William P. Bittinger,

Who graduated from Medical College of Virginia in 1923, and has since been connected with Pine Camp Hospital, Richmond, has located in Huntington, W. Va., with offices at 1018 Sixth Avenue.

Unit to be Added to Hospital.

Plans are being formulated by the board of directors of Memorial Hospital, Lynchburg, Va., for the building of a second unit, this year, which will provide about fifty additional beds. The cost of this will be approximately $85,000. This hospital is owned by the Marshall Lodge of Masons.

The Medical Society of the District of Columbia,

At its annual meeting in December, elected Dr. Thomas A. Groover president, Drs. Oscar B. Hunter and John A. Foote vice-presidents, and Dr. Coursen B. Conklin, all of Washington, secretary-treasurer, for the ensuing year.

Dr. J. W. Reed,

Of Norfolk, Va., is much improved following an operation recently performed at St. Vincent's Hospital, that city.

New Health Officer.

Dr. Samuel Downing, Newport News, Va., has been appointed acting health officer of that city, to fill vacancy caused by the resignation of Dr. Coleman B. Ransome.

Dr. Horace G. Longaker, of Newport News, has been appointed assistant health officer.

Dr. J. M. Talbee,

Formerly of Coaldan, Va., has accepted a position with a coal corporation in West Virginia.

Dr. Eliot Honored.

A number of medical friends of Dr. Llewellin Eliot, of Washington, D. C., tendered him a luncheon on December 16, which marked his completion of fifty years of practice in Washington.

The Los Angeles Times

Has just issued its Midwinter Number, a feature it started when Los Angeles had a population of less than 25,000. The Annual tells of the immense forward strides made during the past year by a city and suburbs of approximately a million and a half people. This amazing story of development, in seven illustrated divisions, depicts Southern California as America's ideal summer as well as winter resort, and makes one have the fever to go and see for himself.

Dr. Houston R. Farley,

Of the class of '04, University College of Medicine, and a native of Giles County, Va., after a number of years as surgeon in the U. S. Navy, has opened offices at Pulaski, Va., and will specialize in surgery.

Dr. D. Hunter Marrow,

After spending the summer and fall months at Union Level, Va., has returned to Daytona, Fla., for the winter season.

Dr. E. V. Valz,

Who has for some time been commander of the medical service on the U. S. S. Arkansas, has been transferred to the Naval Air Station, at Pensacola, Fla.

Obituary

Dr. John Nottingham Upshur,

Richmond, died at his home in this city, December 10, after a short illness. He was born in Norfolk, Va., nearly seventy-seven years ago. Dr. Upshur received his academic education at Virginia Military Institute and, at the age of sixteen, entered the Confederate service in the war between the states and was wounded at the battle of New Market. He graduated from the Medical College of Virginia in 1868, since which time he had practiced his profession in this city and was recognized as a leader in the set known as "family physicians." He was a charter member and ex-president of the Medical Society of Virginia, ex-president of the Richmond Academy of Medicine, and of the Tri-State Medical Association of the Carolinas and Virginia, and a vestryman of St. James Episcopal Church, in all of which he was actively interested.

For a number of years Dr. Upshur was connected with the teaching staff of the Medical College of Virginia, having had charge of several different chairs. He is survived by his widow and four children, two of whom are Dr. F. W. Upshur, Richmond, and Major Alfred P. Upshur, of the medical corps, U. S. A., stationed at Galveston, Texas.

Resolutions by Richmond Academy of Medicine, on Death of Dr. Upshur.

At one o'clock in the morning of the tenth of December, 1924, a distinguished fellow of the Richmond Academy of Medicine died. The death of Dr. J. N. Upshur terminated the career of one of Richmond's leading practitioners, and one of the oldest and most influential members of this society. A life so useful, eminent and consistent in virtue, may justly receive a preamble concerning its leading items, before this membership, assembled to do honor to his memory.

John Nottingham Upshur was born at Norfolk, Va., February 14, 1848; he was educated at the Virginia Military Institute; he received his medical education at the Medical College of Virginia, graduating in 1868. From the time of graduation to his last sickness, Dr. Upshur gave practically his entire time to the practice of medicine in the City of Richmond. He was a charter member of the Richmond Academy of Medicine, and was a loyal and faithful member; he was a distinguished president of the society for a term; he was a charter member also of the Medical Society of Virginia; its president in 1902-03; an honorary member in 1903 to the date of his death. Dr. Upshur's professional work was in the Faculty of the Medical College of Virginia. After some years of teaching in minor positions, he was made Professor of Materia Medica and Therapeutics from 1884 to 1894; Professor of Practice of Medicine from 1894 to 1899; Emeritus Professor of Practice of Medicine from 1899 to the day of his death.

Dr. Upshur was an active member of the American Medical Association, the Tri-State Society, the Southern Medical Association. He was a more or less regular contributor to the clinical literature of his time. He attended medical societies, read carefully prepared papers and discussed subjects presented. He was a leading man.

The foregoing brief recital of some of the points in the life history of the lamented fellow is all too inadequate as an expression of what the life of Dr. J. N. Upshur means to this Academy.

Born of a long American ancestry, filled with the breeding of a long line of Virginia's best tradition and culture, educated and trained by a mother and father, who drew deeply from an inheritance of Virginia's finest folk, Dr. John Nottingham Upshur, dying in his 76th year, having practiced medicine in Richmond for over fifty years, may well serve for our membership as an example of that fine type of Christian physician whose works are worthy of emulation and recital.

The professional qualities of our departed fellow

are known. He was earnest, accurate and thorough in his mental processes. He applied his mind with care to scientific medicine. During and following his professional years he was a leading practitioner and consultant in this city.

His teaching was effective. He discoursed upon medical subjects with clearness. His students held him in high regard, and he was ever ready to serve.

His practice was large in the fullness of his career and he spent himself freely in his work. He was an upright man and he adhered to the highest ethical standings in personal, professional and public life. He was a follower of the right as he saw it and he was ever ready to defend a position or a cause. He was a religious man—a devoted churchman. He was persuaded that neither death nor life, nor angels, nor principalities, nor powers, nor things present, nor things to come, nor heights, nor depth, nor any other creature could separate him from the spiritual side of life. He was no materialist; he was a scientific and successful man of medicine, but he believed in and lived in the belief that spiritual life was the highest state of man.

Following the paths of righteousness and pursuing the duties of a physician through many years, this honored fellow left a memory worthy of contemplation and emulation.

So it is with a feeling of deep appreciation of the superior qualities of the service and life of Dr. John Nottingham Upshur, an ex-president and charter fellow of this society, that we bow with recognition to the will of a Supreme Being on the occasion of his death.

And, BE IT RESOLVED, That in honor of his memory a page in the minute book of this society be dedicated on which this appreciation shall be inscribed, that in testimony of the sympathy felt for the family of our deceased comrade, a copy of these resolutions, with preamble, be sent the family, and that the same be published in the *Virginia Medical Monthly.*

A. G. BROWN, JR.,
P. W. HOWLE,
R. C. BRYAN,
Committee.

Dr. Robert French Compton

Died at his home in Charlottesville, Va., November 21, 1924, after a long illness. He was born in Harrisonburg, Va., forty-nine years ago. After attending the academic department of the University of Virginia, he took up the study of medicine and received his medical diploma from the University in 1900. Following this, he served a year as demonstrator of anatomy in the medical school of his alma mater. He then spent several years studying in New York and attended various European clinics, preparing to specialize in diseases of the ear, nose and throat. On returning to Charlottesville, he was elected to the professorship of oto-laryngology in the Medical Department of the University of Virginia and was also visiting surgeon to University Hospital in this branch. He had been a member of the Medical Society of Virginia since 1906. In addition to his interest in the medical profession, Dr. Compton was an active worker in the Presbyterian church, at the time of his death being chairman of the board of deacons of that denomination in Charlottesville. His widow and two daughters survive him.

Dr. James Terrell Redd

Died December 13, at his home at Churchland, Va., after a long illness. He was a native of Henrico County and his funeral was held from Emmanuel Church, just outside of Richmond, in which church he grew up. Dr. Redd graduated from Richmond College in 1888 and served as adjunct professor of mathematics in the College until he took up the study of medicine at the Medical College of Virginia. He obtained his diploma in medicine in 1895 and shortly thereafter moved to Churchland where he practiced until his last illness. He was actively engaged in church work and was also a Pythian and a Mason. He had been a member of the Medical Society of Virginia since 1895. Dr. Redd is survived by his wife, two sons and a large family connection.

Dr. John Byvancke Dickinson,

Of Cismont, Va., died December 17, death being attributed to suicide. He was a native of England and about fifty-five years of age. He graduated from the Medical College of Virginia in 1893 and had practiced in Albemarle for the past ten years. He was at one time a member of the Medical Society of Virginia. The ill health of his wife, in Bermuda at the time of his death, and late business reverses are presumed to have been the cause of his taking his life.

Dr. Isaac Norval Baker

Died early in December at his home at Whitacre, Va., at the age of eighty-three years. He graduated from the Southern Botanico-Medical College at Macon, Ga., in 1884, but had not been in practice for some years.

Dr. Nicholas J. Worthington.

News has been received at Winchester, Va., of the death of Dr. Worthington, which occurred recently at his home in Guelo, South Rhodesia, Africa, as a result of double pneumonia. He was a native of Maryland but lived for a time at Winchester. He was a graduate of the medical department of the University of Virginia but had been engaged for some years in gold mining in South Africa.